Section 3: Fostering Child Cognitive Development Through Access to Green Space

Karen A. Tuddenham
Yale School of Forestry & Environmental Studies

“Young hearts, young leaves, flowers, animals, the winds and the streams and the sparkling lake, all wildly, gladly rejoicing together!”
— John Muir, The Story of my Boyhood and Youth.

Children are drawn to nature. Plop any five year old down in the middle of a forest or field, sit back and watch. Within minutes she will begin to look around, touch blades of grass, or pick through leaves and acorns. Leave her a while longer and the relationship might become more involved, the child picking flowers or throwing rocks into a stream. Come back in a few hours and you might find her up a tree, facing down a skunk, or hidden away inside a fort of her own making.

Within those few hours of risk, self-discovery and imagination a connection will have been born – something intangible but valuable – between the subject and the object, child and nature.

Researchers today are just beginning to study the components of this connection. What they are finding, perhaps not surprisingly, is that contact with the natural world has a powerful, measurable effect on a child’s social, emotional, physical, and cognitive development and health. A few of the most important effects are (Moore, 1997):

· Improved attention resources and corresponding cognitive function.
· More resilience in response to stress.
· Greater imagination and creativity.
· Skills development, including motor, communication and decision-making skills.

How many children today actually have an experience comparable to the one described above? Where, amid the piano practices, TV, computer games, and homework, does a child find the time? And where, in an increasingly urbanized environment crisscrossed by highways and strip malls, can she find the space?
In England in the mid 1970s Robin Moore began to ask these questions by studying patterns of access to the outdoors among eight to twelve year olds. What he found was a rapidly diminishing contact between children and their natural environments. This gap, termed the “nature-deficit disorder” by journalist Richard Louv, has since been studied by those increasingly concerned about the implications of this deficit, not only for the relationship of humans to their environment but also for human health itself.

John Muir’s ideal childhood, lived afoot and afield in communion with nature, is rapidly becoming a thing of the past. Stephen Kellert (2012), a social ecologist based at the Yale School of Forestry and Environmental Studies, reports the following startling numbers:

· In an average week, the typical child spends less than 40 minutes outdoors.
· In 2010, a typical child spent about 52 hours a week engaging in electronic media, including television, computers, and video games.
· Over 90 percent of their time, children are indoors.
· In the last decade, the area in which children play (their “home range”) has decreased by 90 percent.

In the children of the last few decades, we are seeing the symptoms of an epidemic of disconnection from their natural environment (Louv, 2005). While it is hard to track the exact effect of these changes on children and the adults they become, an expanding body of research suggests that the absence of green space in their lives could negatively affect their physical and psychological health over time.

In recent years, pediatricians and educators have seen a dramatic increase in diagnosed developmental disabilities among children, including learning disabilities and attention deficit disorders (ADD and ADHD) (CDC, 2011). At the same time, mental illness continues to be a major concern for this population (National Alliance on Mental Illness, 2013). Could some of these trends be correlated with nature-deficit disorder?

Humans evolved in close contact with the natural environment, shaping and being shaped by it. Because of this, time in nature may actually be necessary for the development and maintenance of cognitive function in the brain. Drawing from the fields of evolutionary biology, cognitive neuroscience, psychology, sociology, child development and design, researchers are gradually teasing apart the complex ways in which we are influenced by our surroundings. As this section will describe, these scholars are largely concluding that we must take active steps to reconnect adults and children to the natural environment.
The Children and Nature Network

The Children and Nature Network (C&NN) was founded in response to concern over “nature-deficit disorder.” It is at the center of a growing movement striving to reconnect children and nature, serving as both a clearinghouse of information and resources, as well as a nexus for collaboration among researchers, educators, institutions and individuals devoted to creating “a world in which all children play, learn, and grow with nature in their everyday lives.” C&NN’s literature reviews and publications provide an excellent summary of the research conducted in this field and its website is full of useful links.

For more information see: www.childrenandnature.org

3.1 How Does Nature Matter in Child Development?

Nature has been cited in many studies for its potential role in shaping or maintaining child physical and psychological health. In addition to the cognitive and emotional development benefits mentioned above, other benefits from time spent in nature include improved self-confidence, discipline, independence, as well as more developed “sense of place” and “connectedness” to social groups. Natural landscapes, it seems, grant children a unique setting in which to explore their world, connect to others and fully develop their minds. Importantly, researchers are also finding that the earlier we get out, the better (Bird, 2010).

What Makes Children Different?

Children are particularly affected by their environment because, compared to adults, they are more vulnerable and less likely to have control over their surroundings. In addition, their neural plasticity is far greater than that of adults, meaning that their brains are still developing and open to different outcomes in terms of developing functional cognitive networks (Wells and Evans, 2003). The environment children grow-up in molds them in ways that follow them into adult life. Indeed, the “life stress” that children are subject to at an early age may permanently change the way their neural connections are formed and function, putting them at a disadvantage later in life (Louv, 2013; Kristof, 2012).

Wells and Evans (2003) have investigated the possibility that natural environments may serve as a “buffer” for such stress, mitigating the negative effects of adverse events and conditions and increasing children’s natural resilience to change and trauma. By examining the level of psychological distress and reported “global self-worth” of children in different environments, Wells and Evans found that exposure to natural environments (defined by a high amount of plants and natural surfaces) seemed to reduce or attenuate the negative emotional effect of stressful life events in children.
The positive effects of exposure to nature were most pronounced in children who had experienced acute stressors like the changing of a home or school, undergoing family strife like divorce or being bullied. Wells and Evans suggest a variety of mechanisms for these findings: children who are exposed to more nature may have greater external resiliency in the form of tighter social networks, which can provide support in times of need, or greater internal resiliency such as improved mental perspective, clarity, or the ability to constructively problem-solve.

**Why are Children More Disconnected from Nature?**

Children of today are highly stimulated and busier than ever. They have far less time to simply go outside and discover the world for themselves and, increasingly, far less ability to get outside if they wanted to. Interestingly, the No Child Left Behind Act of 2001 has been blamed partly for this trend, as the policies of this law often led to reductions in the amount of time that children spent in recess – a time when they can play outdoors freely – in favor of more structured class time (Strife and Downey, 2009). At the same time, natural environments are threatened by development, pollution, and other human impacts, and as urban populations continue to grow, fewer children grow up with easy access to green space. By 2030, it is believed that 70% of the world’s population will live in urban areas (Kuo 2010).

According to experts, other factors contributing to loss of time children spend outdoors are many and varied. They include (Charles and Louv, 2009; Moore, 1997):

- Availability and sophistication of electronic media.
- Changing family relations.
- Commercialization and over-structuring of play.
- Lack of access to green space.
- Reduction in recess or play time.
- Increased distance in suburban areas from school to home and increased vehicle commute times.
- Parental fear of the risks and dangers posed by the outdoors, including the “Bogeyman Syndrome” (in which parents fear that children will be abducted, kidnapped, or physically harmed if they play outside).

**What Does this Mean for Children of this Generation?**

A number of studies have explored the cognitive development of children who are unable to play outside due to factors including:

- An unsafe play environment;
- A lack of availability of open space;
- Poverty; or
- Parents who do not have the time or resources to supervise their children outside.
Five year old children in Zurich who were unable to play outside showed “poorer social, behavior, and motor skills and had fewer playmates than children with easy access to the outdoors,” according to a study conducted in 1995. Similarly, a Swedish study that compared children in all day outdoor day care facilities with children in a more traditional setting in an urban area found that the children who spent time outdoors had better motor coordination and greater capacity to pay attention (Wells and Evans, 2003). Other studies have looked at the social effects of natural environments on families, one finding a decrease in domestic violence in Chicago public housing units that are greener (Kuo, 2010). This work supports the idea that accessible green, outdoor spaces improve cognitive function, well-being, social interaction and social connectedness in children and their families, particularly in impoverished urban communities where need for such spaces may be more acute. We do not need longitudinal studies to tell us that closer-knit, more peaceful communities and families make for less-traumatized, happier children, who are capable of better facing obstacles later in life (Kuo 2010).

The Role of Play

“Man is most nearly himself when he achieves the seriousness of a child at play.” – Herodotus

Research has shown that children who play in green spaces feel better about each other and about their environment than those who do not. “Play” and the space in which children play are critical for developing motor and social skills. The type of play is particularly important, with unstructured play, defined as imaginative, creative, self-discovery without guidelines and often without the guidance of adults, being especially beneficial.

According to Frances Kuo, a researcher at the University of Illinois, much of current play is highly game-mediated, with clear goals, rules, and markers of success. Spontaneous, unregulated play may be much less end-driven and success can be much more broadly defined (Kuo, personal correspondence, 2010, April 26). Rather than scoring points in a structured game like basketball or football, children might collaboratively build a fort or find and observe insects in a stream. Some research has even shown that bullying may be reduced in green spaces where natural barriers prevent overcrowding (Bird, 2010).

Biophilia

Harvard biologist Edward O. Wilson developed the theory of “biophilia” to describe the natural affinity of humans to natural patterns, landscapes, and non-human species. It suggests that we are genetically programmed to form emotional connections to the places and species alongside which we evolved and that we are drawn to natural spaces in which we can thrive mentally and physically.

Stephen Kellert, a social ecologist at Yale University, has further expanded on this, concluding that biophilia actually encompasses a wide array of values that describe how we “attach meaning to and derive benefit from the natural world” (Kellert, 2012, xii). Nature in this view reflects a fundamental human need that is crucial to our fulfillment as individuals. Kellert has authored a number of books and articles on biophilia, ecological design, and the importance of natural environments for adults and children.
For children, Kellert writes, “direct experience” of nature is necessary for physical, emotional, intellectual and moral development. Psychologist Robert Pyle calls the current phenomenon of children staying indoors the “extinction of experience” and he warns that it could have dire consequences. Without direct experiences that tie them into the natural world, children may never fully develop the relationships and understanding that help them take on a role in a greater environment, nor will they value it in the same way (Kellert, 2012). Biophilia is the evolutionary and mechanistic underpinning of how our environments affect us.

### 3.2 Early Childhood Development

Educational and health research in recent years has highlighted the importance of early childhood years (prenatal to eight years of age) on the lasting health of an individual. According to the World Health Organization (WHO), these years are the most important for development throughout life. This is when the most intensive brain development happens and it is also a time when children are the “most sensitive to the influences of the external environment” (WHO, 2009).

Adequate stimulation is crucial to learning and growth, while adverse influences of stress or unsupportive home environments can inhibit a child’s emotional, cognitive, and social development, preventing him or her from reaching full potential later in life (WHO, 2009).

Nature is a uniquely diverse, stimulating, and changeable environment that supports children’s growth in the early years. The current policy focus in the U.S. today on early childhood education provides an excellent opportunity to integrate more contact with nature into children’s lives.
**Udeskole and Waldkindergarten: (Outdoor Schools and Forest Kindergartens)**

In parts of Europe, especially in Germany and Scandinavia, there has long been a movement to create outdoor schools, in which class and all other activities actually take place outside. In the Forest Kindergartens, a concept that has recently spread to the U.S., young children spend several hours outside every day, regardless of the weather, frequently taking advantage of nearby wildland parks and open spaces.

The *Udeskoles* are based around the concept of regular compulsory educational activities outside the classroom for children aged seven to 16. Curricula focus on cross-disciplinary, experiential learning experiences, such as the combination of math and home economics developed by one Norwegian math teacher who had his students build and use a home made scale to weigh ingredients as they made wild blackberry jam. Reported benefits from these schools include higher levels of physical activity throughout the school day and improved attention abilities.

For more information see:

http://blog.childrenandnature.org/2013/02/12/udeskole-in-scandinavia-teaching-learning-in-natural-places/


**School Achievement**

An unpublished study from Frances Kuo’s lab has taken ten years of data from nearly 500 Chicago schools to study impacts of school “greenness” (determined through examination of aerial photos) on standardized test scores in half a million students.

Researchers found a predictive correlation between school greenness and academic performance, both between schools in a given year, and in the same schools over time. Not only did schools that had more greenery around them show higher test scores, even when demographic factors like wealth, ethnicity, race, and gender were controlled for, but when individual schools became more green (through landscaping or plantings), children’s learning (as shown in test scores) showed a marked increase at the time of the change (Kuo, personal correspondence, 2010, April 26).

Several older studies support these findings. For example, a study from 2000 showed that children who moved to housing with more nearby nature gained higher levels of cognitive function (cited by Wells and Evans, 2003). Research from 2002 looked at the effect of nature on girls living in Chicago public housing. When their views out the window were more “natural,” containing more greenery, girls could better concentrate, delay impulses, and delay gratification. All of these are indicators of success in life that might help with academic achievement while also helping the children avoid such pitfalls as petty crime, teen pregnancy, and drugs (Taylor, Kuo, and Sullivan, 2002).
Improving the greenness of public housing complexes in urban areas could help youth improve self-discipline and concentration, leading to positive life outcomes (Bird, 2010).

**Adolescent Experiences: The Outward Bound Model**

Adolescence is a critical time in development, when many children are particularly vulnerable to depression, emotional instability, and feelings of isolation as they develop a sense of identity. Several studies have found a puzzling reduction in interest for natural places during the time of adolescence. This is when children may move from wanting to play outside to hanging out indoors in places like malls. This has been explained as a “reduced affinity to nature with preference for time spent with their own peers” (Bird, 2010). However, it has also been shown that exposure to nature during the teenage years can provide an incredibly positive influence on adolescence during this rocky time.

A large-scale survey of more than 800 participants in outdoor programs such as the National Outdoor Leadership School, Outward Bound and the Student Conservation Association, summarized some of these benefits. All three programs are challenging wilderness-based experiences targeted mainly towards adolescents and young adults. Participants consistently reported major effects on their personal and character development from these trips. Three-quarters of respondents considered it to be one of the most important experiences in their lives. Among the psychological, sociological, and physical benefits found in this study and others like it were improvements in:

- Self-confidence;
- Self-worth;
- Autonomy;
- Self-reliance;
- Strength;
- Coordination;
- Problem-solving;
- Working with others;
- Decision-making;
- Ability to cope with stress; and
- Communication ability.

Many young participants also reportedly felt a stronger sense of self-identity alongside a greater appreciation for and connection to nature (Kellert 2012).

However, wilderness trips of this sort are not universally accessible to all adolescents. Other approaches, a couple of which are described below, might prove equally effective in providing young adults with formative connections to the natural world.
The Nature Conservancy’s LEAF program is another approach that is immersive, but less challenge or wilderness-focused than programs like Outward Bound.

### The Nature Conservancy: LEAF Program

LEAF, or Leaders in Environmental Action for the Future, provides paid summer internships on Nature Conservancy preserves for students in environmental high schools across the US. From 1995 to 2011, it served over 500 students, mainly diverse youth from urban areas.

Reported impacts from the program include an increased awareness of possible environmental career paths, conservation literacy, self-confidence, professional work skills, independence and love for the outdoors. A high percentage of LEAF alums go on to successfully complete their higher education and to stay engaged in environmental issues. LEAF also provides environmental educators with resources and networks to share experiences and knowledge with each other.

For more information see: [http://www.nature.org/about-us/careers/leaf/index.htm](http://www.nature.org/about-us/careers/leaf/index.htm).

A growing network of environmental high schools like the Common Ground School (highlighted later) are another example of longer-term programs that engage adolescents at an age when much of their identity and relationship with the outdoors might be formed. These schools use environmentally-themed curricula integrated with outdoor trips to provide experiential, hands-on learning as well as leadership and community development for students.

A list of LEAF partner high schools can be found at [http://www.nature.org/about-us/careers/leaf/partner-schools/index.htm](http://www.nature.org/about-us/careers/leaf/partner-schools/index.htm), while the Green Schools National Network provides a directory of other environmental schools (K-12 and otherwise) at [http://www.nature.org/about-us/careers/leaf/partner-schools/index.htm](http://www.nature.org/about-us/careers/leaf/partner-schools/index.htm).

### The Decline of Environmental Knowledge

A study from the University of Cambridge in 2002 tested children’s knowledge of common wildlife species (like badgers and beetles) versus characters from Pokemon, a popular children’s game and television series. Children successfully identified 78% of the Pokemon “animals” on printed cards, but only 53% of local wildlife (Bird, 2010).

This example is representative of the obstacles we are up against. Both children and adults today are less familiar with common species than they were in the past and less comfortable in outdoor settings. In extreme cases this can lead to “ecophobia,” or fear of the natural world. This discomfort and fear in turn can lead to a tendency to devalue natural places and species, as we understand them less. Coupled with a human habitat that is increasingly less
biodiverse, it may soon become impossible for the children of the next generations to know what they are missing or feel that nature is important (Charles and Louv, 2009).

**Implications for Adult Life**

These findings have profound implications for the future of environmental stewardship. A study of the environmental attitudes, behaviors, and beliefs of 10,000 adolescents between 1976 and 2005 found that adolescents’ environmental concern has decreased since the 1990s. This corresponds with an unwillingness to take personal action to protect the environment, or engage in conservation measures, like reducing energy use (Wray-Lake, Flanagan, and Osgood 2009 as cited in Charles and Louv, 2009.)

Work by several researchers shows that the best predictor of environmental behavior as an adult is sustained time spent in wild, natural areas as a child. Free play and exploration, sometimes mediated by an adult family member who modeled respect for and interest in nature, are also key experiences cited by environmentalists as reasons for their commitment (Sobel, 2012). Today’s children, however, are often too distracted and too alienated from nature to have these experiences—so who will be the environmental stewards of the future?

Groups like Outdoor Nation (http://outdoornation.org/) attempt to bridge the gap by creating a movement of college-age youth interested in outdoor recreation. Outdoor Nation, as well as other groups, like the Outdoor Resources Review Group, suggest that outdoor experiences as well as training for the future job market are key in providing for our future stewardship needs as a nation.

### 3.3 Nature as Treatment

As discussed in Section 3 above, time in nature may provide rest for our direct attention networks and prove restorative for both adults and children. Such a natural benefit may have profound implications for youths with attention disorders, such as ADD and ADHD.

ADHD, according to the American Academy of Pediatrics is “the most common neurobehavioral disease of childhood” (Kuo and Faber Taylor 2004, p. 1580). A recent New York Times article reports that 11% of American school-age children have been diagnosed with ADHD.

Researchers and clinicians have struggled to find satisfactory long-term treatment for patients with ADHD. Chemical treatment of these disorders is problematic and many physicians express concern at over-prescription and overuse of costly and potentially harmful ADHD medications in children (Schwarz and Cohen, 2013).

However, research by Frances Kuo and Andrea Faber Taylor at the University of Illinois indicates that exposure to green outdoor environments may reduce ADHD symptoms in children. In one study, young children with ADHD were taken on 20-minute walks in three settings—a residential neighborhood, an urban downtown, and a city park. Afterwards, the children were given tests of concentration by a researcher who did not know which walk they had taken. Children’s concentration after the park walk was consistently better.
than in the two other settings (Faber Taylor and Kuo, 2009). Notably, their performance improvement was comparable to or better than that seen in peak performance boosts from taking Metadate CD and Concera, two widely prescribed ADHD drugs (Kuo, 2010).

Another study of 450 children with moderate to severe symptoms of ADHD across a broad range of demographics showed that this effect is not just limited to parks. When these children engaged in common weekend or afterschool activities in green settings, as well as in less green settings, such as the indoors or outdoor areas without vegetation, their parents were asked to rate the severity of their symptoms after the activity.

Parents consistently reported a “green advantage.” The children who had spent time in a green setting showed improved attention and reduced symptoms of ADHD. While considerably more research is needed in this area, these findings suggest a hopeful solution for many children struggling with ADHD. The authors propose a possible regime of “green time” every day to expose children to the outdoors in order to treat or at least ameliorate some of their disorder’s symptoms (Kuo and Faber Taylor, 2004).

Relief from ADD symptoms afforded by play indoors versus outdoors.

**ADD Kids:**

“Go Out and Play!”

ADD symptoms in children are relieved after spending time in nature. The greener the setting, the more the relief.

Image Source: http://www.cbf.org/ncli/problem/nature-deficit

While the American Academy of Pediatrics has not officially integrated these findings into its policy statements, many of its 57,000 members have shown their support for children spending time outdoors. C&NN provides a special portal for pediatricians to access and learn about this research and, additionally, offers physicians suggestions for what they can do to be involved. For more information see: http://www.childrenandnature.org/pediatricians/.
3.4 Equity

As the importance of nature for child cognitive development has been more widely recognized, equity and environmental injustice have emerged as key issues in children’s access to the outdoors. Strife and Downey (2009) point to childhood development and access to nature as an important “New Direction for Environmental Inequality Research.” Past child environmental health research has tended to focus more on disproportionate exposure to toxics in low income neighborhoods than on lack of exposure to green space. The work that has been done suggests that not only are low income and minority youth less likely to have good access to green spaces than white and higher-income youth, but that they are also less likely to have positive experiences in nature (Strife and Downey 2009).

Low income neighborhoods in Los Angeles, many of which are primarily communities of color, are less likely to have adequate park access than richer neighborhoods. These and other barriers render Latinos and African Americans less likely than Anglo Americans to use nature centers, local parks, and outdoor recreation areas. Differences in cultural preferences, language barriers, program expenses, racial discrimination, lack of transportation and unfamiliarity with natural areas are all contributing factors to this gap (Strife and Downey 2009). These differences may be deepened by a lack of cultural diversity in environmental education staff at nature centers and recreation areas, as well as perceptions from minority communities that these places are “for White people with money” (Strife and Downey 2009, p. 111).

While increasing park space and improving park facilities in low-income neighborhoods are one way to tackle this problem, such responses may give rise to other problems. Since urban greenspace has been shown to increase property values, enhancement of greenspace in neighborhoods may actually have the unintentional effect of forcing out low-income residents (Frumkin, 2005).

Across the country, conservation organizations are realizing that in order to survive they need to expand the demographics of their movement, and partner with organizations who have interests in common. Consequently, they are broadening their approach to take into account the needs of underserved communities (Forbes, 2011).

Major barriers still exist, however. Some experts suggest that conservationists may need to change their paradigms for land preservation and meet communities of color on their own terms if they are to overcome these obstacles (Rue Mapp, personal correspondence, 2013 April 4th). The connection between conserving green space and improving human health is one possible area of common ground.

In addition, if existing inequalities in access and use of natural areas are to be rectified, children and adults from low income and minority communities must be able to also access the health benefits that accrue to people who spend time recreating outside. This may require considerable outreach, and active removal of existing barriers to opportunities for connecting with nature.
Rue Mapp of the group Outdoor Afro notes that often, merely reaching out to children in diverse communities is insufficient to actually engage a whole population and provide them options for outdoor recreation. The following two organizations focus on the family as a whole, creating a longer-term solution that has benefits not just for children but for entire communities:

- **Youth Enrichment Strategies (YES)**, a non-profit based in Richmond, California is dedicated to “deepening relationships through experiences in nature” by bringing youth and families on multi-day camping trips around the San Francisco Bay Area and in nearby redwood forests. These camps provide parents with a welcome – “mini-vacation” where they can reconnect with their family members, their community, and sometimes even communicate across cultural divides with their neighbors. YES provides Spanish translation services, as well as home-cooked meals, programming for children and adults, and a staff member for each family who accompanies them throughout the weekend and helps address any needs they might have. For more information see: http://www.yesfamilies.org/viewpage.php?page_id=9

- **The Oakland Feather River Camp** takes a similar approach, running a number of camps throughout the summer for families from Oakland. These camps are run by the organization Camps in Common, which commits itself to building community and promoting respect for both human diversity and natural habitat. For more information see: http://www.featherrivercamp.com/programs-family.html

Other organizations, including land trusts like the Massachusetts-based Trustees of Reservations are also focused on creating improved programming that will allow whole families to have engaging experiences on conserved land.

### 3.5 Solution Spaces

Solutions to the current nature-deficit epidemic must be creative, multi-leveled, and multi-faceted. When she advocates for the creation of healthier human habitats, Frances Ming Kuo boils the best responses down to three main principles (Kuo 2010, p. 35):

1. “Provide as much nature, in as many forms, as possible.”
2. “Bring nature to people.”
3. “Bring people to nature.”

Principles such as these are being reflected across disciplines in design, education, access, land protection, policy, and partnership efforts to capture these benefits for children’s development.

**Design**

Evidence shows that green environments must be experienced deeply and for long periods of time to yield maximal benefits. But, as Section 3 described above, even briefly viewing green pictures or landscapes can produce some of the same positive mental effects of, for
example, a long hike (Kuo, 2010). While it is critical that the time that children spend outside in natural spaces be prioritized, even interior environments can be made more green through the strategic placement of windows, plants or depictions of nature where they can be perceived and experienced.

Biophilic design principles that emphasize naturalized green space and place-specific elements could help support child development and mental health on multiple scales (Kellert, 2012). These same ideas, of creating better “habitat” for children, should be applied in the planning of cities, residential communities, homes, and places where children naturally spend time, like playgrounds. Children of a certain age need to explore as they learn, and to seek out mysterious and hidden places.

White-Hutchinson

White-Hutchinson is a company that designs and builds green child care centers. They specialize in naturalized playground design for young children that encourages creative play and interaction with nature. Their natural playgrounds use participatory design to meet children’s needs while employing green elements like moving water, multi-leveled vegetation, animal habitat, materials that can be moved around and manipulated, along with child-proportioned nooks and crannies. Some examples of their work may be seen at: http://www.whitehutchinson.com/children/playgroundexp.shtml

“Green” schools may enhance student performance in a variety of ways. School settings could be designed to better facilitate learning, mental health, and attention capacity in children by striving to be more green. Schools themselves could administer small “doses” of natural treatment for students with attention disorders, merely by creating more natural space inside and outside of the classroom. Schoolyards could have more natural plantings, vegetable gardens, trees, and flowers that would attract wildlife, while classrooms could contain plants, aquariums and windows with green views.

Environmentally-based lessons and curricula in a variety of subjects (from math to English) have been shown to increase student interest in subjects and lead to higher test scores, while also putting the natural elements of green schools in a learning context (Faber Taylor and Kuo, 2008). Careful design of school schedules to allow time for play and design of curricula that include experiential classes would provide an important complement to the physical layout of a campus.
The Common Ground School: A Charter School with a Purpose

The Common Ground School in New Haven, Connecticut is a charter high school, environmental center, and urban farm all in one. The school is located on 20 acres of city park land on the edge of one of Connecticut’s largest parks – West Rock State Park. Its simple, wood-framed buildings are surrounded by trees, vegetation and its urban farms – where students learn to raise livestock and vegetables. The environmentally-themed curriculum changes from semester to semester, focusing in on one theme, like “climate change” or “water” to engage students in the big issues they will be facing in their lifetimes and to enable them to see relevant connections with their own lives. The success of Common Ground’s students corresponds to findings that show students using environmentally-themed curriculums usually perform better on standardized tests than their peers in more traditional programs.

For more information see: commongroundct.org

As environmental curricula become more mainstream, organizations like the State Environmental Education Roundtable (www.seer.org) are helping develop guidelines for integrated environmental learning.

Educational Programming and Engagement

It is hard to compete with the newest video game for a child’s attention. In a world where each week seems to bring a new device for technological play, it’s no wonder that children are less interested in spending time outdoors.

But as more and more people recognize the importance of connecting kids to the natural world, school clubs, educational centers and other organizations have launched hundreds of programs and initiatives designed to get kids outdoors. These opportunities abound – it is merely a matter of tracking down the nearest ones to find a program serving your community.

The following section lists some innovative approaches to environmental education, along with some of the organizations that are using them.
**The Sierra Club: “Building Bridges to the Outdoors”**

The Sierra Club has been among the leaders in involving children in outdoor activities. Through the “Building Bridges to the Outdoors” program of their “Mission Outdoors” branch, they focus on giving children throughout the US access to outdoors experiences. In conjunction with the Outdoor Alliance for Kids (OAK), they are working as part of the First Lady’s “Let’s Move” campaign to create challenges and activities for children to participate in activities outside. Their “Inner City Outdoors” Program focuses on getting urban youth into the outdoors.

For more information see:

http://www.sierraclub.org/missionoutdoors/

http://www.letsmove.gov/lets-move-outside

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**Unplugged Week**

The Campaign for Commercial Free Childhood has launched an annual “Screen-Free Week” that encourages children and families to take the pledge and turn off their computers, TVs, and other devices for a week of reconnecting with nature, family and play.

For more information see: http://www.commercialfreechildhood.org/screenfreeweek

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In a very different approach, an experiment was conducted on children participating in Youth Day in Los Angeles, CA. Some groups of children were given technology-based outdoor activities (like taking photographs) and others were given non-technology-based outdoor activities (like a natural scavenger hunt or taking natural rubbings). The technology-based activities were rated higher by participants, suggesting that perhaps there can be a role for technology in helping children reengage with the outdoors (Chavez 2009 as cited in Charles and Senauer, 2010).

Increasing numbers of nature education programs are now successfully taking advantage of children’s fascination with electronic gadgets to stimulate interest in outdoor learning. Nature photography, cell phones with bird calls and the use of GPS devices are becoming ever more popular in environmental education (Outdoor Resources Review Group, 2009).
Letterboxing, Geocaching, and Questing

The Connecticut Department of Energy and Environment is actively engaging the public through “letterboxing” and geocaching programs that place record books, stamps and other prizes to be found and collected throughout Connecticut’s state forests.

“Quests” are activities developed by land trusts that are a combination of treasure hunt and education game that lets participants unravel a story about the place they are in while wandering through the fields and forests to get to a specified location, where they will often find a stamp and a log book. It is an engaging activity for families and creates a child-driven initiative to explore the depths of conserved land.

For more information see:

http://wlt-dev.accessionmedia.com/quests

Another approach involves using students’ innate sense of equity and fairness to engage them and create an emotional connection to the environment. Many of the students at Common Ground are themselves from low income communities and when they participate in real world projects that bridge the gap between social and environmental justice, they develop an understanding and an investment that transcends simple academic interest.

For example, students in one class brought vegetables they had grown to sell at a retirement home that had no other local source of fresh produce. There they talked to the residents and eventually helped build a garden bed for them (Spear, personal correspondence, 2013, May 6th). As a result, not only did the students spend time outside, producing food through their own labor, but they also became invested in the environment and the good of their community.

Regardless of how children are engaged, it is clear that partnerships with educational institutions will be one of the cornerstones of any effort to build healthier humans from childhood up.

Access

It is not enough that there be parks for children to play in – in order for health benefits to be realized, children must actually spend time outside playing in places like parks. In many neighborhoods these opportunities simply do not exist.
Improving human health by increasing access to natural areas: opportunities and risks

Trust for Public Land: Parks for People Initiative

The Trust for Public Land’s Parks for People Initiative helps plan, fund, and build parks where they are most needed. Partially in response to a study conducted by the Centers For Disease Control that showed that more than 80% of US census blocks are located more than half a mile from the nearest park, TPL works toward the goal of providing every child with access to a park or playground within a ten-minute walk of home.

For more information see:
http://www.tpl.org/what-we-do/initiatives/parks-for-people/

It should be noted, too, that mere proximity is not enough. When neighborhood parks are perceived as unsafe, they will not be used by children. Proper maintenance of and ensured safety at parks are extremely important parts of the equation (Kuo, 2010).

Land Protection

Without green space and natural land to play and learn on, children will not have the same opportunities that earlier generations had to benefit from nature. As per their mission, many conservation organizations are taking on the challenge to ensure that these places continue to exist.

The Conservation Fund: A Children and Nature Focus

The Conservation Fund works to conserve land for future generations. Among their focus areas are their Children and Nature projects, which help protect land for kids to get outdoors. They have also partnered with Richard Louv of the Children and Nature Network to hold the National Forum on Children and Nature. In 2008, the Forum endorsed 30 demonstration projects across the country that creatively reconnected children with nature.

For more information see:
http://www.conservationfund.org/our-conservation-strategy/focus-areas/children-nature/
Policy

At the state, national, and international levels, a growing recognition of the connection between natural landscapes, environmental education and child health has spurred the creation of a movement to embed these principles in policy initiatives.

No Child Left Inside Initiative

The No Child Left Inside Bill of 2009:

- Emphasized the importance of environmental education in the United States;
- Set forth a process to create state environmental literacy plans; and
- Sought to establish a grant system to support environmental education.

Opponents of the bill claimed that it had a political agenda that should not receive federal funding. It was not passed in 2009 but was reintroduced to Congress in 2011 with the support of 60 cosponsors. Although it has not been enacted, in many states, chapters focused on achieving the goals of the initiative have popped up and have helped facilitate the formation of environmental education initiatives that make use of local parks and green spaces.

At the first-ever White House Summit on Environmental Education, held April 16, 2013, then EPA administrator Lisa Jackson announced the formation of a Federal Interagency Task Force on Environmental Education. She also committed $5 million in EPA funds for environmental education to be deployed through the National Environmental Education Foundation (NEEF).

A Right to Nature?

In September 2012, the World Congress of the International Union for the Conservation of Nature (IUCN) passed a resolution on the “child’s right to connect with nature and to a healthy environment,” calling for the inclusion of this right in the United Nations Convention on the Rights of the Child. This was a follow up to a report co-written by the Children & Nature Network and the IUCN Commission on Education and Communication that showed that children worldwide are spending more time indoors and less time in free play outdoors.

For more information see:

http://www.childrenandnature.org/news/detail/addressing_childrens_nature-deficit_disorder_bold_actions_by_conservation_l/
Many federal and state agencies, from the US Forest Service to the Connecticut Department of Energy and Environment, are starting their own initiatives to engage youth outdoors. For example, the National Environmental Education Foundation (NEEF) – a group comprised of environmental educators, scientists and healthcare professionals – was established in 1990 as a complementary organization to the Environmental Protection Agency.

**Partnerships**

Creative partnerships are key to connecting kids to the green space that they need. Whether it is building the momentum to have lobbying power as part of a broader coalition, or finding the land to run youth outdoor empowerment programs, organizations and individuals across the spectrum are getting together to magnify their positive impacts.

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**The Trustees of Reservations and Boys and Girls Clubs of Western Massachusetts**

The Trustees of Reservations, one of the oldest land trusts in the U.S., has been partnering with the local Boys and Girls Club, an organization that provides training, mentorship and opportunities for youth in need, to provide access to natural areas where Boys and Girls Clubs can run programs. They have worked together on community gardening projects and even on the purchase of Mt. Tom, a former ski area, which is the site of a future youth summer camp for the Boys and Girls Clubs.

For more information see:

http://www.thetrustees.org/email/find-your-place/partnering-community.html

http://www.thetrustees.org/places-to-visit/pioneer-valley/little-tom-mountain.html

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**The Outdoors Alliance for Kids (OAK)**

The Outdoors Alliance for Kids is a strategic partnership of businesses and non-profits united with the common goal of expanding the number and quality of opportunities for children, youth and families to connect with the outdoors. It includes organizations like The Sierra Club, YMCA, The American Heart Association, and The Children and Nature Network, as well as companies such as REI and The North Face. The coalition lobbies for policy objectives that support its mission.

For more information see:

http://outdoorsallianceforkids.wordpress.com/
3.6 Possible Questions for Discussion

- How can we better connect children with the outdoors in the face of continuing innovation and competition from technological entertainment?

- What are effective educational models that incorporate natural settings and elements into children’s daily environments?

- What indicators can we use to continue studying the effects of nature on children, and how do we disentangle these findings from intuition or nostalgia?

- What role does equity play in considering access to greenspace? How can these principles and research findings be incorporated into low-income housing or school systems? Who could or should fund such work?

- What are the cultural barriers to children playing outdoors? Do they differ across the country? What are the ways to overcome or work with these barriers?

- How can land trusts and community organizations work in tandem to better achieve the goals of equity and access to the outdoors?

- How do you make land conservation relevant to today’s youth and to their families? How do you get them to care and form emotional connections to land?

- How do you balance out active land use by children and families with the need to preserve delicate landscapes and species?

Some of the Organizations Doing Interesting Work on this Topic

Information and Advocacy

- Therapeutic Landscapes Network: http://www.healinglandscapes.org/related/play.html
- The Child and Nature Alliance of Canada: childnature.ca
- Every Child Outdoors: http://www.everychildoutdoors.org/landing
- Outdoors Foundation Special Report on Youth participation in the outdoors: http://www.outdoorfoundation.org/research.youth.html
- White Hutchinson summary of recent research: http://www.whitehutchinson.com/children/articles/benefits.shtml
- Outdoor Nation: http://outdoornation.org/

Getting kids outside

- Wilderness Society Youth Recreation: http://wilderness.org/youth-recreation
Policy

- Outdoors Alliance for Kids (OAK): http://outdoorsallianceforkids.wordpress.com/
- State Environmental Education Roundtable: www.seer.org
- National Environmental Education Foundation (NEEF): http://www.neefusa.org/

Schools

- Green Schools National Network: http://www.greenschoolsnationalnetwork.org/
- Environmental Charter Schools (CA): http://ecsonline.org/our-approach/
- Common Ground School: http://commongroundct.org/
- Cedarsong Nature School: http://cedarsongnatureschool.org/
- Eastwood Forest School (UK): http://www.urbanforestschool.co.uk/

Works Cited / Useful Readings


Kuo, Frances E. Landscape and Human Health Laboratory, University of Illinois at Urban-Champaign, IL. Personal Correspondence, April 26, 2013.


Mapp, Rue. Founder Outdoor Afro. Personal Correspondence April 4, 2013.


Spear, Melissa Executive Director, Common Ground School/Urban Farm, CT. Personal Correspondence, May 6, 2013.


3.7: Examples, sources of information and other key points from the discussion

Some of the examples, sources of information and key points from the discussion included the following:

Participants noted many exciting new initiatives that seek to improve child health through more contact with nature and the outdoors. Less well-known, but more long-standing, examples were also offered, alongside new research supporting the benefits of time spent outdoors:

- One avenue of “low-hanging fruit” in the effort to get kids active and outdoors is transport to school. In the last few decades bus and car travel has largely replaced walking and biking to school. Many initiatives seek to turn this trend by making active transport to school a better alternative for kids in many American communities. The National Center for Safe Routes to Schools has targeted fostering active transport as one of their primary goals, in addition to other concerns around safety. They combine community organizing...
The national advocacy group, the National Environmental Education Foundation (NEEF) has published a concise “fact sheet” on the connection between nature and children’s health. It provides details on common health risks to children, trends in rising diseases like asthma and obesity, and the role that time spent outdoors can play in modulating more common disorders, like ADD and ADHD. For more information see: www.neefusa.org/assets/files/NIFactSheet.pdf

The Urban Wildlife Refuge Initiative of the U.S. Fish & Wildlife Service (USFWS) is an exciting new avenue for forming partnerships between child health and education programs and nature conservation and advocacy groups. “How do we teach a new generation to love the land,” the USFWS writes in an announcement for the program, “when pavement is what they usually see?” This new initiative is based on an understanding that “Americans will have much of their direct contact with nature while in an urban setting, thereby shaping the nation’s conservation values, ethics and priorities,” requiring the USFWS “to reach beyond our boundaries.” This initiative will seek to bring wild nature deeper into cities through new parks, expanded partnerships, and changed management strategies and values. Ten “demographically and geographically varied cities” will be chosen to host the program, which began
in 2010 and will soon leave the planning and recommendation phase. For more information

Increasingly concerned with lifestyle impacts on public health in the US, The Robert Wood
Johnson Foundation recently began a “Culture of Health” initiative designed to foster more
vibrant and healthy US communities through changed values. They envision an America,
“Where good health flourishes across geographic, demographic, and social sectors. Where
being healthy and staying healthy is an esteemed social value. And everyone has access to
affordable, quality health care.” Through their blog on this topic the Foundation shares “our
thoughts and ideas on how best to realize this vision” and fosters active engagement “in the