

A PARTNERSHIP WITH NATURE

Jean Larson, PhD, CTRS, HTR

Abstract

Nature-Based Therapy seeks to improve essential components of human health and wellbeing by facilitating valuable opportunities to learn and engage with living, green, non-built nature. There is growing scientific evidence to support the multiple benefits of time spent in nature, urging a call for increased clinical and public health studies to better understand these relationships. Literature suggests that engaging people with nature in lasting and meaningful ways requires intentional activities that relate to everyday life, that bring family, friends and community members together. This paper will examine the foundations of building and implementing one such sustained, structured program at the University of Minnesota, called 30x30 Nature Heals.

Keywords: Nature-Based Therapeutic Services; Nature-based therapy; Biophilia; Nature Heals.

Copyright: ©2018 Larson. This is an open access article distributed under the terms of the Creative Commons Noncommercial Attribution license (CC BY-NC 4.0), which allows for unrestricted noncommercial use, distribution, and adaptation, provided that the original author and source are credited.

INTRODUCTION

Humans benefit from interaction with and immersion in nature, defined here as the non-built world of water, air, earth, vegetation, and all living creatures. Synergy in nature happens when two species perform 'services' for each other that they would not otherwise be able to accomplish alone and that are mutually beneficial. This unique relationship found in nature is grounded in mutualism and contains elements of altruism, reciprocity, and functional interdependence. For example, when a bee

gets its food from a flower's nectar, the flower is in turn fertilized by pollen carried on the legs of the bee, carried from another flower, and so on. Other life forms including human beings eat the fruit produced from the pollinated flower and enjoy the honey produced by the bee. Synergy in nature is akin to the principles of partnership posited by Dr. Riane Eisler, which include characteristics of shared leadership, mutuality, interdependency and mutual respect (Eisler, 2005). These characteristics are building blocks for the healing framework of Nature-Based Therapeutic (NBT) Services.

NBT began as a model of *shared leadership*, a collaboration between Earl E. Bakken Center for Spirituality & Healing and the Minnesota Landscape Arboretum. NBT treatment interventions are designed as intentionally facilitated activities pairing humans with plants, animals, and nature to exact measurable outcomes in human health and wellbeing. These interventions necessarily include elements that foster shared leadership, mutuality, interdependence and mutual respect. NBT modalities include:

[therapeutic horticulture](#) - planned therapeutic interventions pairing people with plant-related activities

[animal-assisted interventions](#) - intentional therapeutic interventions partnering people and animals together

[care farming](#) - participants with differing needs interacting in market farming, gardening, and animal husbandry, designed for therapeutic outcomes

[therapeutic landscapes](#) - the application of landscape architectural design focused on the therapeutic needs of varying populations

[green exercise](#) - planned outdoor exercise to harness the therapeutic benefits inherent in nature

The development of NBT was informed in part by my personal experience with nature's healing powers and the gift of a learning disability.

THE WILD CHILD

I was considered a “wild child,” with extra-large amounts of physical energy and an undiagnosed language-based disability. I was often misunderstood by my teachers, but my parents recognized my unique ways of knowing, so they promoted the use of experiential learning and hands-on inquiry to help me learn. My parents also encouraged my full expression of self through many wonderful engagements with nature and animal companionship.



Figure 1. Author with draft horse team, Tom and Jerry, circa 1983

Having been placed in special education classes, I was given the opportunity to learn with other students experiencing intellectual and developmental disabilities. They in turn taught me about compassion, respect, and a pure expression of feelings and vulnerability. Along the way I began to understand that to thrive emotionally, it was essential to treat people with warmth and esteem, admiration, authenticity, unconditional positive regard, and playfulness, meeting people where they are, taking time to find out who they are and where their passions lie, and weaving all this into the foundations of emotional intelligence. Learning alongside students with similar needs and differing abilities held a mirror that helped me to understand shared leadership, interdependence, mutual respect, the power of empathy, and opening the heart to a life of service. They helped me understand the foundations of partnership.

BIOPHILIA

Fast-forward to 1992, and the table was set for creating Nature-Based Therapeutic services based on mutual respect and partnership with people, plants, animals, and nature. Over the course of 26 years of working with people in therapeutic programs, it was not uncommon for me to hear people describe their experience as deeply healing and transformative when immersed in nature and all its beauty. This healing relationship between people and the earth can be described by the term “*biophilia*,” hypothesized by E. O. Wilson (1984).

Biophilia is our “innate urge to affiliate with other forms of life and lifelike processes” (Wilson, p. 1). Nature-Based Therapy seeks to improve human wellbeing through the principles of biophilia by facilitating opportunities to experience, learn, and engage socially with nature. While the term biophilia might be relatively new, the idea isn’t. Humans co-evolved with nature, and we know it to be essential to our physical, mental and spiritual survival. The industrial revolution caused a major shift away from human interaction with the natural world. Up until then our lives were integrated with nature and therefore our collective conscious was influenced by interactions with the surrounding environment and the spaces where plants, animals, and natural landscapes intersect. Research over the past 30 years strongly suggests that our individual and planetary ill-health are based in part on a disconnection from nature (Lederbroggen et al., 2001; Peen et al., 2010).

The healing benefits of nature

Biophilia in human experience suggests an innate biological link to nature and access to its many benefits. According to the Environmental Protection Agency (Klepeis et al., 2001), the average U.S. citizen spends 87% of their life indoors, and another 6% in automobiles, for a total of 93% of life spent in enclosed interior spaces. Only 7% of our lives (one half of one day per week) are now spent outdoors. This is particularly noteworthy for children, whose overall time outside has decreased significantly in the

recent past (Louv, 2005). Research has noted a significant relationship between sedentary behaviors and childhood obesity (O’Brein et al., 2016). There is a growing amount of research discussing the multiple benefits of time spent in nature, prompting a call for increased clinical and public health studies to better understand these relationships (Barton et al., 2016; Pretty et al., 2016; Pretty et al., 2007).

There are a number of reasons why time spent out of doors and in nature is an increasing area of focus in scientific literature. The benefits to human health and wellbeing are well established. A classic and frequently cited study (Ulrich 1984) examined the effect of patient access to a window view of nature on recovery rates from gall bladder surgery. Two groups of patients were matched by age, sex, weight, tobacco use, and previous hospitalization, differing only with respect to having or not having a window with a view in their hospital rooms. One member of each pair looked out onto a group of deciduous trees, while the other’s window view was of a brick wall. The study results showed that those patients with the natural view recovered faster, required fewer analgesics, and had fewer complaints recorded in the nurses’ notes.

Further research studies have found that time spent in nature helps relieve stress (Thompson et al., 2012; Horiuchi et al., 2013), increases memory performance (Wilcox et al., 2008), boosts creativity (Brymer et al., 2010), enhances attention (Berman et al., 2008; Hartig et al., 1991; Kaplan & Kaplan, 1989), improves quality of sleep (Ulrich, 1984), and influences quality of life for those struggling with dementia and mental illness (Bratman et al., 2012; De Vries et al., 2016; Mitchell et al., 2015). These findings are robust whether the nature-based activities involved physical exercise (e.g. treadmill walking inside or walking outside; Rogerson et al., 2016) or reflected having more access to tree canopy environments (World Health Organization, 2016). Data specific to the pediatric population indicate that children who spent more time outdoors in nature were generally more active and had a lower

likelihood of being overweight (Center for Disease Control and Prevention, 2017; O'Brien et al., 2016; Swami et al., 2016).

These studies have significant public health implications. A review of 21,420 articles by Husk, et al. (2016) found that participation in environmental enhancement activities resulted in “participants' positive experiences related to personal/social identity, physical activity, developing knowledge, spirituality, benefits of place, personal achievement, psychological benefits and social contact” (p. 3)

A meta-analytic review by Hartig and colleagues (2014) summarized the benefits of urban green space and health across the lifecourse as social cohesion, improved air quality, increased incentives/motivation for physical movement and exercise, and stress reduction. These benefits were identified as having significant personal and public health outcomes (Hartig et al, 2014; Von Lindern et al., 2017). Additionally, the data support an increase in the following areas:

- pro-nature mentality (Loureiro & Veloso, 2014)
- pro-environmental behavior (Well & Lekies, 2006)
- creativity (Capaldi et al., 2014)
- relaxation to focus on specific tasks (Capaldi et al., 2014)

The literature supports the benefits of contact with nature if the contact involves engaging nature over time. Engaging with nature in lasting and meaningful ways requires intentional activities that relate to everyday life and outcomes that bring family, friends, and community members together. The literature supports growing efforts to create sustained, structured opportunities beyond single or sporadic experiences, for healing to happen (Atchley et al., 2012).

(Re)Connecting with nature

One such effort took place in a study conducted in the United Kingdom, called “30 Days Wild” (Richardson et al., 2016); it challenged 18,600 individuals to spend “wild

time” in nature. There were 101 activities introduced and promoted on a website to motivate individuals to spend time engaged with nature. Participants were also prompted to share ideas and activities with others through social media outlets. Results from the study found that individuals who participated in daily nature-based activities for a month reported “sustained increases in happiness, health, connection to nature and pro-nature behaviors” (Richardson, 2016, p. 8). The authors also noted that “the promotion of '30 Days Wild' did not focus on health, well-being or conservation outcomes, but simply conveyed a message that being in contact with nature makes life better” (Richardson, 2016, p. 9). This study resulted in significant improvements in wellbeing for the participants and offered a potential public health intervention that could address both specific physical and emotional health outcomes and attitudes toward nature conservation.

Nature Heals 30x30

Similarly, in 2015 the Nature-Based Therapeutic Services at the University of Minnesota initiated a structured project called “Nature Heals: 30x30”. The project challenged students, staff, and faculty at the University of Minnesota to use a variety of nature-based activities to spend 30 minutes in nature every day over 30 days. Time in nature was defined as *going outside and taking time to notice and connect with non-human life*. The project was designed based on previously implemented projects such as the Suzuki Foundation Nature Challenge (<https://davidsuzuki.org/take-action/act-locally/30x30-nature-challenge/>).

The purposes of the University of Minnesota Nature Heals 30x30 were:

- to call attention to accessible and equitable forms of self-care and stress management found in nature;
- to improve quality of campus and community mental health; and
- to generate critical discussion around public health as created with nature.

To get started, the 30x30 participants first had to “opt in.” Once they were

registered, they began receiving information via email. First, they were encouraged to write down a personal commitment (a goal) on a Nature Heals 30x30 GOAL CARD (see Figure 2). Participants were asked to keep the goal card located in a visible place, such as a computer screen saver, a background image for a phone, refrigerator door, backpack, bathroom mirror, etc., to remind them of the intention behind a daily dose of nature.



My intention for participating in Nature Heals 30x30 is:

Figure 2: Nature Heals 30 x 30 Goal Card

Participants were given five ways to access information about outdoor experiences: A “base camp” as the site of many activities, a Webpage, a FaceBook page, an interactive sculpture project on the St. Paul Campus, and an app.

1. **Nature Heals 30x30 “base camp”** located at the front entrance of the Weismann Art Museum on the Minneapolis campus of the University of Minnesota (<http://wam.umn.edu/>). This site was chosen for its location at a busy intersection for student and faculty pedestrian traffic.

Interactive nature-based activities took place at the “base camp” every day, Monday through Friday, from 11:30 am to 2:30 pm. A total of 45 different activities were offered over the course of 18 days (see Figure 2).

Larson: Partnership with Nature

30x30 Week/Time	Monday - Weisman	Tuesday - Weisman	Wednesday - Weisman	Wednesday - Magrath	Thursday - Weisman	Friday - Weisman	Saturday - Arboretum
Week One 11:00–11:30 Set-up	Meg	Meg	Meg	Brenna	Meg	Meg	10:00 – 2:00 Bus Trip to MLA
11:30–12:30	Base camp programming	Base camp programming	Base camp programming	Brenna	Base camp programming	Base camp programming	
12:30–1:30	Fish Charms - Layl	Bee Squad	Bee Squad PAWS	Brenna	Bee Squad	Base camp programming	
1:30–2:30	Fish Charms – Layl	Bee Squad	Bee Squad		Bee Squad	Base camp programming	
	Health Coaching – Karen Lawson		PAWS		Phenology Walk		
	Yoga - Sonja						
2:30–3:00 Clean-up	Meg	Meg	Meg	Brenna	Meg	Meg	
Week Two 11:00–11:30 Set-up	Meg	Meg	Meg	Brenna	Meg	Meg	10:00 – 2:00 Bus Trip to MLA
11:30–12:30	“River Rangers” Music	Base camp programming	Base camp programming	Brenna	Base camp programming	Base camp programming	
12:30–1:30	Base camp programming	Raptor Center	PAWS	Brenna	Farm Animals	Laughter Yoga	
1:30-2:30	Tyson Forbes	Raptor Center	PAWS	Brenna	Farm Animals	Base camp programming	
		Essential Oils			Phenology Walk		
2:30–3:00 Clean-up	Meg	Meg	Meg	Brenna	Meg	Meg	
Week Three 11:00–11:30 Set-Up	Meg	Meg	Meg	Brenna	Meg	Meg	Dog Days at Arboretum
11:30–12:30	Base camp programming	Base camp programming	Base camp programming	Brenna	Base camp programming	Base camp programming	
12:30–1:30	Base camp programming	Water Bar	Water Bar	Brenna	Water Bar	Base camp programming	
1:30-2:30	Yoga - Sonja	Water Bar	Water Bar	Brenna	Water Bar	Base camp programming	
			PAWS		Phenology Walk		
2:30–3:00 Clean-up	Meg	Meg	Meg	Brenna	Meg	Meg	

Week Four 11:00– 11:30 Set-up	Meg	Meg	Meg	Brenna	Meg	Meg	
11:30– 12:30	Base camp programming	Base camp programming	Base camp programming	Brenna	Base camp programming	Pumpkin Decorating	
12:30–1:30	Base camp programming	Base camp programming	PAWS	Brenna	Base camp programming	Kevin Kling	
1:30-2:30	Base camp programming	Base camp programming	PAWS	Brenna	Phenology Walk	Pumpkin Decorating	
						S'mores	
						Scarecrow Winner Announced	
2:30–3:00 Clean-up	Meg	Meg	Meg	Brenna	Meg	TAKE DOWN!	

Figure 3: Nature Heals “Base Camp” Schedule

Activities ranged from roasting marshmallows, honey tasting, nature inquiry, interacting with a variety of animals, mindfully creating nature-based art projects, slack line challenges, selfies, laughter yoga and others. Over the period of time, more than 3000 people were counted as attending these activities (See Figure 4).

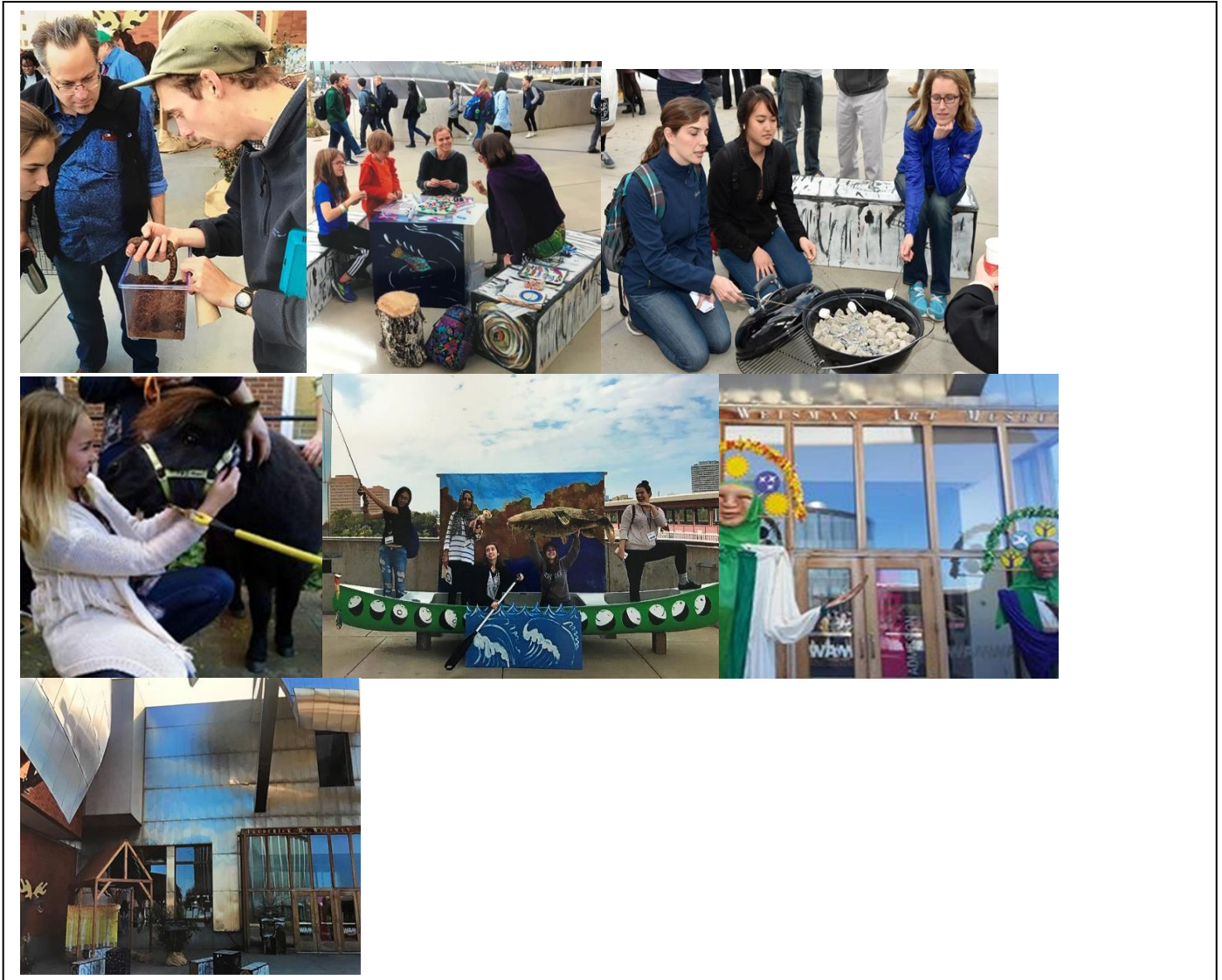


Figure 4. Photos from “Base Camp”

2. **The Nature Heals 30x30 Webpage** had more than 4400 unique visitors between September 30 and October 30, 2015. In addition, the 30-day digital calendar prompting involvement via daily reminders of self-initiated nature-based activities (See Figure 5) was accessed by more than 1400 subscribers on a daily basis.

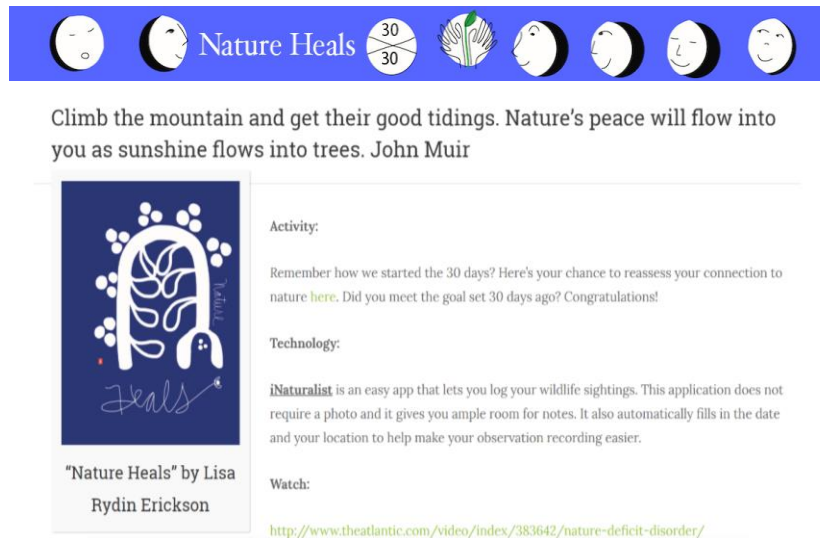


Figure 5: Sample of Digital Calendar Daily Reminder

3. **The Nature Heals 30x30 Facebook page** was designed exclusively for participants to inspire, support, and share daily nature experiences with one another. More than 600 people followed the page during the 30 days of the program. The Nature Heals 30x30 logo (See Figure 6) on all marketing/published material, represents the 30 days of a lunar cycle with a human hand integrated into a leaf from nature.



Figure 6: Nature Heals 30x30 Logo

4. **Nature Heals 30x30 on the St. Paul Campus** served more than 500 students on Wednesdays from 11:30 am to 2:30 pm. The 30x30 activities included a local artist/sculptor who created a different seasonal sculpture (winter, spring, summer, fall) each week for four weeks, with a metaphor for life's transitions. Students were asked to share intentions and contribute to the creation of the sculpture (See Figure 7).



Figure 7: “Summer” Sculpture with Student Intentions Written on Surrounding Leaves

After the 30 days were up, these sculptures (along with the 30x30 website images) were exhibited at the Institute for the Environment on the St. Paul campus (<http://environment.umn.edu/news/nature-heals-art-from-the-30-x-30-project/>)

5. **The Nature Heals 30x30 App** (See Figure 8) gave participants the opportunity to drop pins on a GPS map to show places where they thought nature was most healing. This map helped others find places on campus and in the community to engage with nature; it also helped us track the range of impact Nature Heals 30x30 was having on the community. The app had links to resources such as bird and tree identification; it also linked users to the 30x30 webpage. The app was downloaded on iPhones more than 117 times and on Android devices more than 200 times.



Figure 8: Splash page of Nature Heals 30x30 App

At the end of the 30 days a post-survey showed overwhelming positive feedback from more than 300 participants. Comments included:

- This was the best event this year.
- I could have gone on with this all year long.
- I could only attend the basecamp three times a week on my way to/from class and stopping helped me prepare for class and was helpful after too.
- I wish this could be a part of our course offerings - it fits perfectly with what I am learning in other Public Health classes.
- My professor had us doing these activities as part of class and it was a great addition.
- I hope this continues again and again - it is a great way to start the school year - congratulations on the efforts!

CONCLUSION

Nature-Based Therapeutics modalities are designed to harness the many benefits of partnering with the natural world to enhance our innate inclination to be in harmony

with nature. The wisdom of interdependence and mutual respect are a natural outgrowth of partnering with nature. Efforts like "30 Days Wild" and the Nature Heals 30x30 project offer a public health model to rekindle these naturally occurring values and benefits. There is evidence that the quality of our lives may be enhanced by a renewed connection with the natural world. As data affirming the many benefits of partnering with nature grows, pro-nature and pro-environmental behaviors may be a natural outcome. Growing awareness of interdependency in the natural world will hopefully enhance care and concern for the entire web of life, so that equal value is given to the self and the "other" without whom we would not thrive. Nature-Based Therapeutics may offer a model to partner, respect, and transform our relationship with planet Earth.

Supplementary material summarizing the 30x30 Nature Heals Initiative is available at <https://doi.org/10.24926/ijps.v5i2.1074>.

References

- 30x30 Nature Heals. (2017). Retrieved from <https://umnnatureheals30x30.wordpress.com/daily-activities/>
- Atchley R., Strayer D., Atchley P. (2012). Creativity in the Wild: Improving Creative Reasoning through Immersion in Natural Settings. *PLoS ONE* 7 (12): e51474.
- Bratman, G.N., Hamilton, J., & Daily, G. (2012). The impacts of nature experience on human cognitive function and mental health. *Annals of New York Academy of Science*, (1249), 118-136.
- Barton, J., Wood, C., Pretty, J., & Rogerson, M. (2016). Green exercise for health: A dose of nature. In *Green exercise: Linking nature, health and well-being*; Barton, J., Bragg, R., Wood, C., Pretty, J., (Eds.). New Delhi, India: Taylor & Francis Ltd.
- Berman, M.G., Jonides, J., & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological Science*, (19), 1207-1212.
- Brymer, E., Cuddihy, T.F., & Sharma-Brymer, V. (2010). The role of nature-based experiences in the development and maintenance of wellness. *Asia-Pacific Journal of Health Sport Physical Education* (1), 21-27.
- Capaldi, C.A., Dopko, R.L., & Zelenski, J.M. (2014). The relationship between nature connectedness and happiness: A meta-analysis. *Frontier Psychology* (5), 976. Centers for Disease Control and

- Prevention (n.d.). Obesity Facts. Retrieved from <https://www.cdc.gov/obesity/data/adult.html>.
- Cruzen, P., & Stoermer, E. (2000), The anthropocene. *International Geosphere-Biosphere Program Newsletter* (41), 2.
- De Vries, S., ten Have, M., van Dorsselaer, S., van Wezep, M., Hermans, T., & de Graaf, R. (2016). Local availability of green and blue space and prevalence of common mental disorders in the Netherlands. *British Journal of Psychiatry Open*, 2(6) 366-372.
- Eisler, R. (2005). The power of partnership: Inspiring transformative leadership World Business Academy, 19 (6) 1-12.
- Hamann, G.A., & Ivtzan, I. (2017). 30 minutes in nature a day can increase mood, wellbeing, meaning in life and mindfulness: Effects of a pilot program *Social Inquiry into Well-Being*, (2), 34-46.
- Hartig, T., Mitchell R., de Vries S., & Frumkin H. (2014). *Annual Review of Public Health*, 35(1), 207-228.
- Hartig, T., Mang, M., & Evans, G.W. (1991). Restorative effects of natural environment experiences. *Environmental Behavior*, 23, 3-26.
- Horiuchi, M., Endo, J., Akatsuka, S., Uno, T., Hasegawa, T., & Seko, Y. (2013). Influence of forest walking on blood pressure, profile of mood states, and stress markers from the viewpoint of aging. *Journal of Aging Gerontology*, (1),9-17.
- Husk K., Lovell R., Cooper C., Stahl-Timmins W., & Garside R. (2016). Participation in environmental enhancement and conservation activities for health and wellbeing in adults: A review of quantitative and qualitative evidence. *Cochrane Database of Systematic Reviews*. (5). 4.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York, USA: Cambridge University Press.
- Klepeis, N. E., Nelson, W. C., Ott, W. R., Robinson, J., Tsang, A. M., Switzer, P., Behar, J. V., Hern, S., & Engelmann, W. (2001). The national human activity pattern survey (NHAPS): A resource for assessing exposure to environmental pollutants. *Journal of Exposure Analysis And Environmental Epidemiology*, 11(3): 231-252.
- Lederbogen, F, Kirsch, P, Haddad, L, Streit, L, Tost, H, Schuch, P, Wuest, S, Pruessner, J C, Rietschel, M, Deuschle, M, and Meyer-Lindenberg, A (2001) City living and urban upbringing affect neural social stress processing in humans. *Nature*, 474 (7352), 498-501.
- Louv, R. (2005). *Last child in the woods*. Chapel Hill, North Carolina: Algonquin Press.
- Loureiro, A., & Veloso, S. (2014). Outdoor exercise, well-being and connectedness to nature. *Psico* 45, 299-304.
- Mitchell, R.J., Richardson, E.A., Shortt, N.K., & Pearce, J.R. (2015). Neighborhood environments and socioeconomic inequalities in mental well-being. *American Journal of Preventative Medicine*, 49, 80-84.

- National Center for Health Statistics. (2016). Chapter 18: Health related quality of life and wellbeing. *Healthy People 2020 Midcourse Review* Hyattsville, Maryland: National Center for Health Statistics.
- Nisbet, E. (n.d.). 30x30 nature challenge research results. Retrieved from <https://davidsuzuki.org/wpcontent/uploads/2017/09/results-2015-david-suzukifoundation-30x30-nature-challenge.pdf>
- O'Brien, L., Ambrose-Oji, B., Waite, S., Aronsson, J., & Clark, M. (2016). Learning on the move: Green exercise for children and young people. In *Green exercise: linking nature, health and well-being*. Barton, J., Bragg, R., Wood, C., & Pretty, J. (Eds.). Abingdon, UK: Routledge.
- Peen, J, Schoevers, R A, Beekman, A T, and Dekker, J (2010) The current status of urban-rural differences in psychiatric disorders, *Acta Psychiatrica Scandinavica* 121(2), 84-93.
- Pretty, J., Barton, J., Pervez Bharucha, Z., Bragg, R., Pencheon, D., Wood, C., & Depledge, M.H. (2016). Improving health and well-being independently of GDP: Dividends of greener and prosocial economies. *International Journal of Environmental Health Research*, 26,11-36.
- Pretty, J., Peacock, J., Hine, R., Sellens, M., South, N., & Griffin, M. (2007). Green exercise in the UK countryside: Effects on health and psychological well-being, and implications for policy and planning. *Journal of Environmental Planning and Management*, 50, 211-231.
- Richardson M, Cormack A, McRobert L, & Underhill R (2016). 30 days wild: Development and evaluation of a large-scale nature engagement campaign to improve wellbeing. *PLoS ONE* 11(2).
- Rogerson, M., Gladwell, V.F., Gallagher, D.J., & Barton, J.L. (2016). Influences of green outdoors versus indoors environmental settings on psychological and social outcomes of controlled exercise. *International Journal of Environmental Research and Public Health*, (13), 363.
- Swami, V., Barron, D., Weis, L., & Furnham, A. (2016). Bodies in nature: Associations between exposure to nature, connectedness to nature, and body image in US adults. *Body Image*, (18),153-161.
- 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 Urban Plan*, (105), 221-229.
- Ulrich, R. (1984). View through a window may influence recovery. *Science*, (224), 224-225.
- Von Lindern, E., Lyneus, F., & Hartig, T. (2017). The restorative environment: A complementary concept for salutogenesis studies. In *The handbook of salutogenesis*, pp. 181-195. Berlin, Germany: Springer.
- Wells, N.M., & Lekies, K.S. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. *Children, Youth and Environment*, (16), 1-24.

- Willcox, B.J., Willcox, D.C., & Ferrucci, L. (2008). Secrets of healthy aging and longevity from exceptional survivors around the globe: Lessons from octogenarians to supercentenarians. *Journal of Gerontology - Series A, (63)*, 1181-1185.
- Wilson, E. O. (1984). *Biophilia*. Cambridge, United Kingdom: Harvard University Press.
- World Health Organization. (2016). *Urban green spaces and health: A review of the evidence*. Copenhagen, Denmark: World Health Organization.
-

Jean Larson, PhD, CTRS, HTR, has a PhD in education with an emphasis in therapeutic recreation and a minor in integrative medicine from the University of Minnesota. She manages the Nature-Based Therapeutic Services for the Minnesota Landscape Arboretum and is assistant professor and faculty-lead of Nature-Based Therapy Studies at the Earl E. Bakken Center for Spirituality & Healing. She is a certified therapeutic recreation specialist, a registered horticultural therapist, and has been a Fulbright Specialist in Norway and Taiwan. When not working, you can find Jean at home on her family farm or up north at cabin in BWCAW.

Correspondence about this article should be addressed to Jean Larson at lars0095@umn.edu