Managing vegetation for children: Enhancing free-play opportunities through direct management

By Thomas Marlow, Mike DeBacker, and Craig Young

Abstract

This article explores the potential benefits for children afforded by free play in natural areas and develops a strategy to enhance natural areas for this purpose. Children obtain benefits from contact with natural areas that loosely fall into three categories: behavior, health, and environmental sensitivity. Research reveals that the primary vector for these positive outcomes is free play outdoors. Enhancing free play therefore forms the basis of an implementation strategy, which relies on a multistep approach. First, areas suitable for free play are identified by the presence of three environmental factors identified in the literature: refuge, diversity, and accessibility. From here, projects may be developed with the goal of simple and cost-effective vegetation management. We present several ideas and examples of what projects of this type could look like. Overall, this article offers a simple and cost-effective means to designing cultural and natural landscapes to encourage free play in national parks.

Key words

behavior, Call to Action, children, environmental sensitivity, free play, health, vegetation management

RECONNECTING OUR NATION'S YOUTH WITH NATURE has become a central theme in the National Park Service (NPS) (NPS 2011, 2012). This focus is an understandable response to societal changes that are limiting time spent in natural areas and increasing problems among youth, including poor health, emotional issues, and a loss of environmental knowledge and sensitivity. With this in mind, we explored opportunities for vegetation managers to contribute directly to this growing emphasis within the Service. Our backgrounds in ecology, conservation, and environmental ethics prompt our interest in the topic, and our perspective is shaped by direct experience working with national parks in the Midwest Region through involvement in planning and interpretive activities connected with our work in the NPS Inventory and Monitoring Program.

When considering how to connect children with parks, we see free play as a promising goal for vegetation managers. Free play affords children time to roam around, collect things, make up stories, climb, crawl, throw, and invent games without prompting. The importance of this as a transformative experience that inspires and educates children can be found throughout the literature on environmental education. Richard Louv's influential book *Last Child in the Woods* can be seen as a manifesto for free play (2008). Louv contends that lack of contact with green spaces during childhood is a root cause of many problems seen in children and society as a whole. He dubbed this condition "nature deficit disorder" and prescribed free play outdoors as a remedy. Elements of free play already permeate NPS programs such as bioblitz, Junior Ranger, and Parks as Classrooms. We reviewed the research to ensure empirical connections and to help develop vegetation management strategies to promote free play.

Benefits of free play

We found in this review that positive outcomes resulting from free play can be grouped loosely into three categories: (1) behavior, (2) health, and (3) environmental sensitivity. Studies reveal that natural areas like the national parks help restore our ability as humans to focus, thus making them potentially helpful in managing attention deficit disorder (ADD and ADHD) (Faber et al. 2001). Research examining the physical health benefits of play in natural areas is likewise promising.

Free play is linked to developmental benefits such as increased motor skills in young children while also increasing activity levels in children and adolescents (Fjørtoft 2001; Klesges et al. 1990; Sallis et al. 1993; Cleland et al. 2008; McCurdy et al. 2010). Although this may be an intuitive conclusion, it is nonetheless a vital outcome in an age when childhood obesity rates continue to rise, putting a whole generation at risk of related health problems.

Finally, the role that nature plays in developing awareness and sensitivity to environmental problems should not be undervalued.

We feel that free play is a very open-ended goal that, if based on the design principles we have derived from the empirical research, can be confidently promoted at little cost.

Contact with nature is one of the most significant life influences that emerge in studies and is therefore important in developing environmentally connected citizens (Chawla 1998, 1999).

We acknowledge that some of these benefits require significant time and frequency in the outdoors. The National Park Service's urban parks, national recreation areas, and easily accessible community parks, as designed, provide the opportunity for frequent visits that may extend throughout childhood (please see the brief case study on free play at Indiana Dunes on page 48). It is to this group of parks that this research is most applicable and the recommendations particularly relevant. (For a more complete review of the research linking outdoor play with benefits for children, please refer to Marlow et al. 2013.)

Strategies

Our literature review prompted us to look for ways to manage actively for free-play potential in natural and cultural landscapes. We envision these projects to be unobtrusive, simple, and suited to the particular park. We are not advocating for construction of playgrounds, but rather subtle manipulations of areas identified as particularly well suited for free-play activities. This requirement, that preexisting outdoor spaces have attributes conducive to free play, helps avoid and minimize conflict with other priority uses for these areas. Additionally, because little infrastructure is required, these projects are highly scalable and can be adjusted to the needs of individual parks.

Teams of subject-matter experts in the fields of natural and cultural resources, education, interpretation, and facility management are necessary for such projects. As such, this kind of work affords significant opportunities for interdivisional collaboration through these multidisciplinary teams. In some cases, ongoing management activities may already create unrecognized opportunities for free play and thus allow for free-play projects to become integrated cost-effectively. For example, a project reducing basal density in a forest to its historical precedent may increase the free-play potential of an area by making it more accessible to children. Overall, we feel that free play is a very open-ended goal that, if based on the design principles we have derived from the empirical research, can be confidently promoted at little cost.

Design elements

In order to apply this research to vegetation management, we developed a simple series of questions (fig. 1, next page). After assessing site safety for issues such as the presence of poisonous plant or animal species, the most difficult question to address is whether or not an area is suitable for free play. As a practical starting point, three elements should be considered when planning and designing free-play opportunities in cultural and natural landscapes: (1) refuge, (2) diversity, and (3) accessibility. Each principle is based in part on the research and observations of education professionals.

"Refuge" is a recurring theme in the literature on child play behavior. Studies, as well as anecdotal evidence, demonstrate that children prefer enclosed spaces during free-play time (Kirkby 1989; Nabhan and Trimble 1994). During free play, children seek out areas that are small, enclosed, and protected. MaryAnn Kirkby argued that young children seek refuge as places to play because of a larger developmental bias for areas that are scaled to them and offer safety and security (1989). This is reflected in children's preferences for spaces with multiple "escape" routes and the ability to see out of the area without being able to be seen.

Diversity also factors in as an environmental preference for children (Kahn 1997). Increasing the level of diversity can be thought of as increasing the possible experiences for a child in an area. This requires having rocks of different sizes, trees to climb, crawling spaces, water, dirt, topographical diversity, and animals. Much of this is inherent in nature and outdoor environments, thus making these areas ideal settings for free play; however, where possible, assessing and enhancing diversity may be pursued. Furthermore, qualitative characteristics should be considered as well. For example, a feeling of mystery has been associated with preference in natural scenes and lends itself to drawing in children, exciting their imagination, and fueling their creativity (Kaplan and Kaplan 1995).

Accessibility is a final, important, and multidimensional characteristic affecting free play in children. On one level, making sure there are plenty of entrance points for kids to begin engaging with the space is all that is needed. Kahn (1997) noted that the diversity and complexity of the intended play space should not come at the

Figure 1. Evaluating free-play potential

1. Is the area in question suitable for free play?
There are no set rules for determining the potential for free play, but the following criteria are based on research and should be weighted accordingly. Discretion should, however, be used in the final judgment.

I. Accessibility

- Accessible via trail or road
  - Trail hikes must be considered easy enough for children to complete
- Legibility—one can reasonably hope to enter an area and find one's way out (Kaplan and Kaplan 1995)
  - clear entry and exit points
  - distinct landmarks for easy navigation
  - coherence—the scene make sense overall

II. Diversity

- Integration between vegetation and open spaces (Mårtensson 2009)
- Topographical diversity and physical challenges
  - uneven ground
  - objects for climbing
  - low spaces for crawling
- Elements for manipulation. Including but not limited to
  - edible plants
  - collectible items
- Mystery—the attribute about which one could acquire more information by venturing deeper into the area and changing one's vantage point (Kaplan and Kaplan 1995)
  - Area is marked by any of but not limited to the following attributes:
    – winding narrow trail
    – meandering streams
    – drastic changes in lighting that draws viewers in
    – partially obstructed views
    – enclosures and refuge

III. Refuge criteria

- Presence of at least one proper enclosure (refuge spaces) with some of the following attributes (Kirkby 1989)
  - Ceiling effect (canopy, roof) is present in some enclosures
  - Sub-spaces or a high degree of complexity
  - Visual connections to surrounding environment
  - Multiple access points and "escape" opportunities
- Two or more refuge spaces
- Varied scale of enclosures (Kirkby 1989)
  - small-scale spaces (two to four children)
  - large, loosely joined enclosures allowing more movement and group activity

2. If the area is suitable for free play: Are there ongoing park uses or plans for the area in question?

3. If yes: Do these uses prevent any adjustments to vegetation management or other changes?
As long as an area is suitable for free play (Question 1) and has management plans already in place (Question 2) that do not prevent further modification and management changes (Question 3), then it may be considered as a viable site for the introduction of management for free play.

expense of a child's ability to enter that space, maintain orientation, and eventually find a way out. Accessibility is also important in designing individual spaces within the whole. Kirkby included this in her design principles, saying "Multiple point access to enclosed spaces accommodates individual style, allows 'escape' opportunities, and lends itself to a greater variety of use" (p. 11). She even noted the differences in the size of the entry point, saying that children seemed "attracted to spaces that were scaled to them" (p. 11).

After the team has established the suitability of an area, follow-up questions should be addressed to clarify whether further action is appropriate. Managing particular park areas for children has from the beginning been considered a secondary goal and as such should not supplant existing management goals. We do not want, for example, sensitive natural areas to be opened up to free play. We believe, however, that with a pragmatic, open-minded, and careful approach to these projects, the integrity of a park's natural resources can be preserved. Policy of the National Park Service supports this by defining *appropriate use* to include the promotion of health and fitness and by encouraging visitor activities that are "inspirational, educational, or healthful" (NPS 2006, section 8). These goals are also prominent in the direction set forth for managing national parks in the recent report "Revisiting Leopold: Resource stewardship in the national parks" (NPS 2012) and in the NPS initiative "A Call to Action Plan" (NPS 2011). (For those interested in a more complete discussion and guidance on designing free-play spaces please refer to Marlow et al. 2013.)

From here, many options for simple modifications are available that can be incorporated into existing management plans. For example, in an open field, mowing could have major impacts on the ability of the area to offer refuge and accessibility. For example, mowing to create connected networks of paths could make an area more welcoming while these same paths could offer refuge if carefully designed. Conversely, allowing vegetation to grow higher could offer significantly more opportunities for refuge during free play. Mowing is an easy option as any mowed trails can be widened or narrowed depending on the intended purpose. Narrow networks of trails offer refuge and intrigue for the creative young mind while widening trails could provide the opportunity for diverse play activities. Forested areas require slightly more involvement from managers.

Finally, while free play in its purest form is a spontaneous act by children, in order for the maximum number of children to reap the benefits that free play in the national parks can offer, some prompting and encouragement using more traditional educational curricula must occur. For example, a volunteer entomologist located at a central landmark and equipped with a handful of butterfly nets could offer children the opportunity to collect insects on their own while the volunteer aids in identification. Ornithologists could do the same with binoculars. Historians and geographers could facilitate mapping of areas of interest. Also, the important role of social interaction during free play to create transformative experiences should be taken into account when designing these programs.

Conclusion

Designing cultural and natural landscapes to encourage free play in national parks offers a simple way for managers to respond to several goals set out in the "Call to Action." The planning approach and design principles outlined provide important criteria for implementing these designs for real-world applications. As many of the applications derived from these recommendations will be novel, managers should monitor the effectiveness of the projects. Surveys and other measures could be helpful in the continual modification of projects for children. In this way, management of the vegetation in these landscapes may lead to a number of positive physiological, psychological, and developmental outcomes for children.

References

Chawla, L. 1998. Significant life experiences revisited: A review of research. Journal of Environmental Education 29(3):11.

————. 1999. Life paths into effective environmental action. Journal of Environmental Education 31(1):15.

Cleland, V., D. Crawford, L. A. Baur, C. Hume, A. Timperio, and J. Salmon. 2008. A prospective examination of children's time spent outdoors, objectively measured physical activity and overweight. International Journal of Obesity 32(11):1685–1693. doi:10.1038/ijo.2008.171.

Faber Taylor, A., F. E. Kuo, and W. C. Sullivan. 2001. Coping with ADD: The surprising connection to green play settings. Environment and Behavior 33(1):54–77.

Fjørtoft, I. 2001. The natural environment as a playground for children: The impact of outdoor play activities in pre–primary school children. Early Childhood Education Journal 29(2):111–117.

Kahn, P. H., Jr. 1997. Developmental psychology and the biophilia hypothesis: Children's affiliation with nature. Developmental Review 17(1):1–61.

Kaplan, R., and S. Kaplan. 1995. The experience of nature: A psychological perspective. Ulrichs Bookstore, Ann Arbor, Michigan, USA.

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Kirkby, M. 1989. Nature as refuge in children's environments. Children's Environment Quarterly 6(1):7–12.

Klesges, R. C., L. H. Eck, C. L. Hanson, C. K. Haddock, and L. M. Klesges. 1990. Effects of obesity, social interactions, and physical environment on physical activity in preschoolers. Health Psychology 9(4):435–449.

Louv, R. 2008. Last child in the woods: Saving our children from nature-deficit disorder. Algonquin Books, Chapel Hill, North Carolina, USA.

Marlow, T., M. DeBacker, and C. Young. 2013. Managing vegetation for children. Natural Resource Report NPS/HTLN/NRR–2013/635. National Park Service, Fort Collins, Colorado, USA.

Mårtenson, F., C. Boldemann, M. Söderström, M. Blennow, J. E. Englund, and P. Grahn. 2009. Outdoor environmental assessment of attention promoting settings for preschool children. Health & Place 15(4):1149–1157. doi:10.1016/j.healthplace.2009.07.002.

McCurdy, L. E., K. E. Winterbottom, S. S. Mehta, and J. R. Roberts. 2010. Using nature and outdoor activity to improve children's health. Current Problems in Pediatric and Adolescent Health Care 40(5):102–117. doi:10.1016/j.cppeds.2010.02.003.

Nabhan, G. P., and S. Trimble. 1994. The geography of childhood: Why children need wild places. Beacon Press, Boston, Massachusetts, USA.

National Park Service (NPS). 2006. Management policies. Washington, D.C., USA.

———. 2011. A call to action: Preparing for a second century of stewardship and engagement. National Park Service, Washington, D.C. USA. Available from http://www.nps.gov/CallToAction.

———. 2012. Revisiting Leopold: Resource stewardship in the national parks. National Park Service, Washington, D.C., USA. Available from http://www.nps.gov/calltoaction/PDF/LeopoldReport_2012.pdf.

Sallis, J. F., P. R. Nader, S. L. Broyles, C. C. Berry, J. P. Elder, T. L. McKenzie, and J. A. Nelson. 1993. Correlates of physical activity at home in Mexican-American and Anglo-American preschool children. Health Psychology (12)5:390–398.

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