

A Study of Early Environmental Education Experiences: Can We Legislate Concern and Understanding of the Natural World?

by

Linda K. Ramey, Ph. D.

Wright State University

345 Allyn Hall

Dayton OH 45435

Linda.Ramey@Wright.Edu

Submitted December 29, 2008.

Abstract

When we think of environmental education, we often remember summer camps and scouting. This ongoing study examines childhood experiences and the potential impact of those experiences on fostering a caring concern for the environment. Results, obtained using mixed methodology (quantitative and qualitative techniques), indicate trends present in graphic and narrative data. Data were collected in surveys from 178 participants, ages 20 to 67, including responses that indicate the importance of simply getting children out into the natural world. One troubling aspect of this line of inquiry is the role of recent efforts to legislate and standardize environmental education. This session will discuss the findings of the Early Outdoor Experiences Study while posing key questions about the prior and future directions of environmental education.

Introduction

Politicizing environmental education. When did environmental education move from being about summer camp to a political agenda? The long informal history of environmental education goes back to the interactions of humans with the natural world. The renowned E. O. Wilson, coined the term Biophilia meaning an inner “urge to affiliate with other forms of life and to describe “humans’ love of living things our innate affinity with nature” (1984, 85). Orr also describes this ancestral “preference for certain landscapes such as savannas and in the fact that we heal more quickly in the presence or sunlight, trees, and flowers than in biologically sterile, artificially lit, utilitarian settings.” (2002, 25). But with increasing complexity and industrialization of our world, getting humans, especially young humans into nature has become formalized and politicized. Yet, as stated below, in the summer of 2007, two congressional bills were introduced but so far, one has passed the education subcommittee.

A Review of Recent Related Literature

Recent publications by Louv (2005; 2006); Finch (2008); Blumstein, D. T. and Saylan, C. (2007) and others state that we, namely Americans, have done a poor job of providing children with the kinds of interactions with nature that foster an understanding of how nature works and where humans fit in to the entirety of the natural world – or now referred to as Environmental Literacy. In 2007, the National Council for the Accreditation of Teacher Education (NCATE) adopted “Standards for the Initial Preparation of Environmental Educators”, yet another formalized, political measure of the movement away from what is traditionally cited as Informal

Science Education toward criteria-referenced, standardized tested educational experiences. The lack of urgency in passing The No Child Left Inside (NCLI) Act (H.3036, S.1981, 2007) and renewal of the National Environmental Education Act (originally passed in 1990) are additional evidence of the political direction in which we have been headed.

Award winning Harvard University entomology, E. O. Wilson, who recalls frequently in his many publications, his childhood spent outdoors exploring and actively interacting with his surroundings, notes that this early time in nature set him on a lifelong path of seeking answers and asking questions about flora and fauna, particularly ants. As Wilson (2006) put it, “. . . most children have a bug period, and I never grew out of mine.” Finch (2008) and Louv (2005; 2006), among others, state that for children and others to become invested in nature and knowledgeable as to the ways of nature, they must first spend unstructured play time there – digging in the mud finding worms, watching a leaf float down a stream, study ants as only a child can squat and carefully observe insects. From experiences like these comes an appreciation and love of nature. The NCLI initiative and teacher preparation that includes environmental education are good, as is funding to carry out more focused efforts to get children and families outdoors, but some would argue, as do Blumstein and Saylan (2007), that unless we heed the missteps of the past, we will be making it more difficult to do what we know instinctively to be right.

As we politicize and formalized experiences in the natural world, we are being diverted from the emphasis that truly captures an affinity with nature and engenders so called environmental literacy. One example would be in our preparation of future teachers. In modeling effective teaching by emphasizing environmental education utilizing teaching

methodologies and interdisciplinary curriculum, pre-service teachers are taught to integrate outdoor experiences that foster learning in both formal classroom settings and informal, outside-the-classrooms settings (Ramey-Gassert, 1996;1994). Indications are that we must find ways to blur the lines and make seamless connections between environmental education, academic content standards and unstructured outdoor play, that time of just messing around in nature and growing in understanding, empathy and connectedness with the natural world surrounding us.

In this era, we need to be about finding ways to educate our children, and their teachers and parents, and their neighbors as to the interconnectedness of all of nature, including humans. Studies equate trends increasing “screen time” for children and adults with increasing rates of obesity and diabetes (Nielsen 2008). Many people do not understand the connections between with a lack of understanding of the natural world, less unstructured outdoor playtime for children (Henig 2008). Recent efforts of draw attention to these issues (such as the No Child Left Inside Initiative, 2007), and to get children and families outside are increasing, yet on the whole, the U. S. offers too few opportunities for our students to increase their knowledge of environmental education and associated issues. The impact on one’s ability to feel comfortable and confident outdoors and to develop a caring respect of the natural world is believed to be rooted in childhood play (Nielsen 2008).

Description of the Study

Examining early environmental education experiences. This study examines early outdoor learning experiences and raises questions as to the impact of those experiences on fostering a

caring concern for the environment. Data from surveys of 178 pre-service and in-service teachers, early childhood educators, and home childcare providers ranging in age from 20 to 67, show several trends while pointing out the importance of simply getting children out in to the natural world. One troubling aspect of this line of inquiry is the role of recent efforts to legislate and standardize environmental education, thereby narrowing the potential for children to fully interact with the natural world.

This study contributes to our understanding of the importance of outdoor experiences and in providing children with unstructured time exploring the natural world. Outdoor exploratory play may allow children to develop better self-knowledge, perhaps leading to self-confidence and a greater ability to take calculated risks. Time spent in nature may also allow children to grow in ways that are important, whether measurable, or not.

Information will be presented related to common elements that were evident in data from pre-service teachers and others as to their prior experiences as children in the natural world and how those experiences shaped their understanding of nature. This session will present data collected as part of an ongoing study with potential impact on the political issues, funding and initiatives on the state, national and international levels.

Methodology – Design and Data Collection

The initial idea for this study came from my attending the “Connecting the World’s Children with Nature” Conference conducted by the Working Forum on Nature Education for Young Children in October, 2006. This international conference and the research presented there

established the thinking and questioning to develop a study of outdoor childhood experiences and examination of their role in later life. The research methodology emerged from this conference experience by the researcher. The resulting design of this study was informed by research and information presented at the conference and review of the related literature.

An initial survey was created and field tested to gather preliminary feedback as to the design and the questions asked. 23 pre-service science methods students were used in this phase of data collection. Participants were asked to sketch/draw a map of where they grew up on one side of a sheet of paper and to write a narrative on the other side responding to the questions: What did you do as a child?; where did you play?; what did you do outside?; what did you do for fun? Very minor changes in wording were done to clarify the questions but by and large the data collected was clear and distinguishable.

During this same quarter, an Honors Student expressed an interest in conducting a parallel study of early childhood play areas using NAEYC outdoor play area standards. Her findings confirmed what the available literature indicated – most children in the early childhood centers did not have adequate outdoor play areas (Brand with Ramey, 2007). A question raised by this Outdoor Play Area study concerned the amount of time and the quality of that time children spend playing outdoors at child care facilities.

The next phase to this study was to collect additional survey information from a larger group of participants. Sixty-five in-service and pre-service teachers, homecare and childcare

agency employees and outdoor/environmental educators as well as 90 more preservice teachers were given the survey bringing the number of participants to 178.

Data collected from the survey, both pictorial and narrative data, were analyzed using initial quantitative methods followed by primarily qualitative methodologies, as guided by the research questions. Merriam (1991) and Marshall and Rossman (1989) state that the best approach to answer complex questions such as the overarching and underlying themes in this study, are to use a qualitative approach. Marshall and Rossman (1989) also indicate that the in looking for trends in narrative and the pictorial data, a qualitative inquiry exploratory/descriptive approach is most appropriate. Connelly and Clandinin (1990) recommend incorporation of data such as life experience narratives and survey interview type data as descriptive data to capture information of interest and to inform the study. Creswell (2002) suggests a similar qualitative approach to methodology in examining purposeful, systematic identification of themes within the data. Using this approach, grounded in both the study focus and in the data, the following trends were indicated.

Following this approach for qualitative research, the narrative data was captured and analyzed. First scanned, then, using descriptors drawn from the data, survey narratives were carefully read numerous times then the results tabulated to draw out all of the detailed information presented. Graphic representations that accompanied the narrative survey data were likewise viewed to discern the various elements then mined repeatedly to extract all of the relevant data. The researcher found that some narratives as well as graphic representations were very rich and detailed, while others were extremely simple. In terms of the graphic data, there

were some graphics that were more of a map, with detail that would make it possible to go and physically locate the area described. At this point, I began to label those graphics as “maps” versus sketches/drawings. I also created a 1 to 5 rating scale to differentiate the very simple graphic or narrative data from that which was rich and colorful in details and descriptions of events or places. These rating scales were not looking at artistic abilities as much as quantity of data, or “richness”. Similarly, writing style, spelling and grammar were not used in determining “level or detail or richness” either. A one rating in terms of narrative – “Played in woods and cemetery; Climbed trees; Swam in creek” (N 21) whereas a five rating looked like, “[As a child, I] Climbed Trees – I had a favorite spot; Swinging on the willow tree vines; Walked 2 blocks to small woods - exploring and playing hide and seek and other games; Catching lightening and lady bugs. Started my own garden – totally on my own age 11 or 12, grew cucumbers and pumpkins. Played in sandbox; picked plants and smashed berries, tried to make medicines (tropical); splashed in giant puddles; built hideouts in the tall grass field; Found injured creatures and brought them home, taking them to rehab center. Fishing and catching crawdads and skipping rocks (this was in drainage ditches). Watching ants; playing flashlight tag in evening. Biking to various destinations – library, pool, schoolyard, parks, Dairy Queen.” (N 75). Additional examples of some of the narratives and similar graphic data will be displayed during my presentation.

Results and Conclusions

Looking at the data overall, three respondents were from outside of the U.S., 156 were raised in Ohio, and 21 spent their childhood in other states (Rhode Island to Alaska). Sixty percent of the respondents were female, 40% male.

Of the 178 narratives, there were 49 responses that clearly described the place where they grew up as a rural setting, 55 describing what would be defined as a suburban, and four narratives were set in urban areas. Many of the suburban-type settings were located in what would be termed a small town. Interesting, many of the respondents talked about their childhood home, during the time that they were growing up, as being on the edge of town, “but it is all developed now”.

Trends Noted in the Survey Data. As stated above, both narrative and graphic data for the 178 surveys were examined using a five point rating system ranging from simplicity (1) to rich, detailed (5). Forty five percent of the narrative data was ranked in the midrange with a rating of three. There were 13 out of 178 narratives (7.3%) were a rated a 5 and 43 or nearly 25% were ranked as a four. Both of the ratings of two and one had 21 of 178 surveys for nearly 12% each (see Table 1).

Ranking	1	2	3	4	5
Number of Narratives	21	21	80	43	13
Percent	11.8	11.8	44.9	24.2	7.3

Table 1. Ranking of Narratives, number of and percentage of the survey data.

There were 26 of the graphic representations categorized as maps (14.6% of 178) and 152 sketches or drawings (85.4%). Of the maps, 58% were ranked as 3's (15/178), seven or 27%

were rated as a four, and only 4/178 or 15% were rated as 2's in terms of the level of richness and detail. The drawings/sketches had 65/178, or 43% in the 3 ranking, with 45/178 or 30% in the 2 category. The ratings of 1 and 4 were 21 and 18, respectively, representing 14% and 12% of the total. There were three sketches that were ranked as a 5, being 0.06% of the drawings/sketches category of data. One other potentially interesting sidelight may be further examination of the relationships between these ratings of the narrative and graphic data. Three of the narratives were both ranked as 1, seven were both ranked as 2, 38 were both ranked as 3, 13 were both ranked as 4 and only three were both ranked as 5's on the rating scale (see Table 2).

Ranking	1	2	3	4	5
Maps	0	4	15	7	0
Percent	0	15	58	27	0
Sketches/Drawings	21	45	65	18	3
Percent	13.8	29.6	42.8	11.8	2

Table 2. Ranking of Maps and Sketches/Drawings with number of and percentage of each from the survey data.

Examining the narrative data in terms of “who” they spent their childhood with, 127 out of 178, 71%, responded that they played with siblings, friends and other children in their neighborhood. Not surprisingly, visiting with family accounted for 22% of the survey data about the people with which they spent time. Several narratives also described playtime in childhood as “getting into trouble”, “alone time”, hiding out from parents or others, reading or drawing outdoors perhaps balancing some of the playtime spent with other children. Graphic data

paralleled this information depicting playtime with other children and family pets or farm animals in the majority of the scenes.

What did they do? Not surprisingly, participants noted that they had unstructured playtime in nature, be that a game or sport but more often just “hanging out” or “messing around” in a wooded area, field, ditch or other improvised natural play area. Riding bikes and playing sports were reported in over half of the narratives. Playing sports included backyard, neighborhood or pickup games of baseball, basketball, kickball, softball, football, soccer and so on, but none of the surveys listed club or organized team sports. The next highest category reported was outdoor games: hide and seek, kick the can, ghosts in the graveyard, frozen statues and so on. Again, respondents stated that these were “just games we played with whoever could come out and play,” often after supper or “just after the street lights came on.” Forty of the surveys described building forts (season-dependent -- in the woods or out of snow), tree houses, camps and pretending to be pioneers or soldiers, etc.

Several outdoor activities were cited on numerous surveys: swimming (35 of 178), climbing trees (33/178), farm or gardening chores (30/178), sledding (20/178), fishing (19/178), exploring and hiking rounded out “what” was covered in a large number of survey responses. Animals also played prominently in the data – family pet(s), farm animals, bugs, insects and other “creatures”. Eleven of the surveys listed playing dolls, namely Barbies, as a play activity, but almost all discussed playing with these toys outdoors, namely on the deck or under a tree. One outdoor activity, camping, which would perhaps more often involve adults, was only listed on nine of the 178 surveys. This element, “what did you do?” while it could be inferred from the

graphic data, very few wrote “playing baseball” even though they drew a kid-made baseball field with a tree as second base in an empty lot. The overall evidence from the graphic data supported the information in the narratives, primarily by showing the places where participants’ play occurred.

Examination of the data, in terms of “where did you play?”, found that woods and trees played a prominent role in the 178 respondents’ narratives. Forty eight surveys discussed playing in woods, wooded area, in or around trees. Parks and playgrounds as well as creeks, ponds, and lakes were cited in 45 and 44 responses respectively. Play- and swing sets (38/178) and “In the neighbor’s yard” (34/178) was a great place to play, too. As stated earlier, many of those surveyed grew up in a rural or semi-rural setting – on the farm (29/178), near or in the barn, shed (29/178) or fields (22) and “haymile” or hayloft were also cited in 29 of the narratives. Eighteen respondents specifically recalled playing in the water (one talked of a ditch with water) and in the dirt, often involving bugs and worms. Not surprisingly, this information was depicted over and over again in the maps/sketches that made up the graphic survey data – “my house”, “neighbor’s house”, woods, trees, playground/ball field/empty lot, creek/pond/lake/river/ditch, field/farm, school/yard were recounted in the participant’s drawings.

The majority of survey responses emphasized the importance of open, undeveloped wooded or green space where they played as children. As pointed out earlier with the small number recalling camping experiences, the majority of surveys talked of frequent, unstructured, unsupervised play with other children. Most of the mention of parents or adults focused on vacation time or family gatherings, but even those instances went on to bring in time also spent

with siblings, cousins, or other children. N 2 provides a representative sample: “(I) Built forts in the woods with brothers, played football and baseball on our very own “fields” with brothers, played “town” with brothers on Big Wheels on pavement, played basketball (“around the world”), explored the field behind our house and went on adventures, built tree house in large tree behind our house, lots of imagination in play, rode out go-cart through woods and made a trail, played in the hay pile in the barns and built houses out of bales of straw, rode our horse along the back fence and in the field in the snow, played “kick the can”, “go to court”, “ghost in the graveyard” around the house in the yard.” (N 2).

As Sobel (2001) discusses in his book, another category that showed up as a recurring theme was the emotional ties with “special places” such as a “hide out”, “camp” or “fort” that served as a place to be alone to what we might term as reflection time. Also, some noted in the data that they enjoyed sharing of that “special place” with other children and that that was another emotional type of connection with their childhood experiences in nature. There also were several who stated a sense that something important was missing from the lives of children today, in that they thought they had terrific opportunities to play and explore that they don’t see for today’s youngsters.

As could perhaps be expected, there were notable differences between the outdoor play experiences recounted by urban, suburban and rural children time in the natural world. One narrative portrays an urban childhood experience in distinct contrast to the majority of other respondents. “As a young child my favorite place to play was inside with my mom and sisters. It was a safe place. Outside our home was surrounded by chaos. The local park was sprinkled with

shards of glass and drunken men. The sidewalks had cracks, and the streets were unkind. My backyard was fun from time to time with the rusty swing set, but the best times were inside my home by my mother's side caring and playing with my sisters. Mom tried from time to time to take us to safe outdoor activities. There were cleaner and safer parks, which we explored together." (N 76).

Participants with a rural or semi-rural background generally stated richer outdoor or nature-connected experiences such as capturing insects or observing and/or raising animals/pets. As evidenced in this comment, they also cited more interaction with weather and change of seasons. "As a child we always played outside (my brother and I). We would swim in the pool, climb trees, catch newts, watch the lightning on the front porch. We were out all day—we'd come in long enough to eat and sleep. We didn't have cable – if we weren't out side at our house – we were outside at a friend's house. With my children, we go out as much as possible. We ride our bikes to an area park and play. We'd go outside, even if it was just to color. We usually only stay inside if it is extremely hot or cold." (N 120).

In summary, the data from surveys of participants in this study confirm and perhaps expand somewhat on the trends noted in the literature related to the importance of children's outdoor play and experiences in the natural world..

Some Final Thoughts

These trends are pointed out in what is termed the NCLI literature by authors Louv (2005, 2006) and Finch (2008) and other reports like one by The American Institute for Research (2005). With the growth of suburban areas and more roadways, children are less likely to ride bikes, play unsupervised in available open green spaces. Rather children are shuttled to organized sports or other activities by car or spending what is called “screen time”, be that on the television or computer.

Outdoor exploratory play may allow children to develop better self knowledge, perhaps leading to self confidence and a greater ability to take calculated risks. In addition to youngsters being more psychologically and emotionally fit, mental and physical health are other obviously beneficial benefits from active outdoor play. Time spent in nature may also allow children to grow in ways that are important, whether measurable or not. There are stated benefits of an “ultimate outdoor play area” as defined by the research in this area represents open, undeveloped, unpaved places where children can play and explore in a nature setting. Some of the purported benefits of outdoor activities are that:

- Children who play in ultimate outdoor play areas are more cooperative and more likely to create their own games than those playing on minimum outdoor play areas; green areas promote creativity in children because they demand visualization and the full use of the senses (Louv, 2006).
- Direct exposure to nature is beneficial for emotional health, helps reduce stress and creates a feeling of wellbeing and offers healing for children in a destructive family (Louv, 2005).

- Green play areas promote concentration, self-discipline, social interaction between children and more positive feelings for others.
- Ultimate outdoor play areas, fosters stewardship for the environment and an appreciation for using natural resources respectfully. Creates a motivation to learn; children see education as more than just texts and tests.
- Mental benefits: develop an appreciation of outdoor fun, nature, scenery, sunlight and fresh air. Developing an appreciation for outdoor fun can lead to increased physical behaviors and may help reduce the risk of obesity, heart disease, diabetes and high blood pressure for all ages.
- Nature promotes a significant reduction of the symptoms of ADD for children as young as 5 years old, and helps reduce stress and maintain children's mental well-being (Louv, 2006).
- Teachers can use the play arena to promote learning and enhance school curriculum. National studies indicate that when outdoor environments are used to integrate a school's curriculum, achievement is higher. Increases student cognition; the richness and novelty of outdoors stimulate brain development and function (Rivkin, 2000).
- It reaches the whole person - mind, body and spirit.
- It creates a sense of belonging to a larger community, especially if there is a garden or continuing project in the area (Clarke, 2006).
- And it addresses Howard Gardner's eighth intelligence: Naturalist (Louv, 2005).

This study contributes to our understanding of the importance of outdoor experiences and in providing children with unstructured time exploring the natural world and how those

experiences shaped their understanding of nature. Findings of this qualitative study raise questions for continued research in this area such as: How do we convince schools, parents and childcare providers of the importance of unstructured outdoor play activity for the overall health of children? Can misconceptions of “stranger danger” and other exaggerated concerns be overcome with rational presentation of factual information? Can recalling their own outdoor experiences in nature create a desire for parents to allow their children similar play? And perhaps the most important question for this researcher – can childhood play and deep interaction with the natural world around them, help to foster a love for nature and a commitment to preserving the environment? While the results of this study tend to confirm other cited research finding, it also adds to the growing body of evidence that has potential impact on state, national and international levels. As we learn more of the critical importance of sharing nature with children in terms of their health and overall wellbeing, these insights need to inform our decisions about unstructured exploratory outdoor play.

As the legislation related to Environmental Education, as outlined above, and the enactment and funding of such initiatives appears to be stymied in Congress, many who work with teachers and children to increase environmental literacy are attempting to move ahead as evidenced with NCATE enacting Standards for the Initial Preparation of Environmental Educators (2007). These environmental education teacher preparation standards, when enacted on the various state levels, will do more to solidify the role of outdoor education in and hopefully, out of school.

Prominent authors such as David Orr (2002, 2004) and Bill McKibben (2007) point out the disconnects between human's present policy and decision making processes and our current consumer-driven economies and the regard for the natural world and living conserving resources to foster sustainable lifestyles for humanity. These examples of more worldly, long-range thinking regarding the environment and natural resources in terms beyond just human consumption is an imperative for upcoming generations.

There is also a critical need for informed environmentally literate citizens, thereby insuring educated decision-makers as we face crucial long term choices pertaining to environmental issues, choices and resulting behaviors. Difficult questions need to be asked of policy makers and even more difficult decisions need to be made as to our global responsibilities (Hawkin 2007). How do we raise environmentally literate children and community members, who have a caring concern for the natural world? How do we ensure the safety of children while giving them the outdoor experiential based required to engender a clear understanding of the factors in play and what is at risk? Can we move forward with educating children, through childhood play experiences, as to the intricate complexity of natural systems? How much of this thinking is first heard with the heart – how do we engender understanding and caring concern for the natural world? Does the answer lie in outdoor play and exploration as children? This piece of the puzzle may be the critical link, the key to having informed members of the public as well as future leaders.

References:

- American Institute for Research. (2005, January). Effects of Outdoor Education Programs for Children in California. American Institute for Research. Retrieved September 23, 2006, from <http://www.air.org/news/documents/Outdoorschoolreport.pdf>
- Brand, R. with Ramey, L. (2007). Assessment of Outdoor Play Areas of Ten Early Childcare Facilities. Wright State University Honors Program. Unpublished Senior Honors Study.
- Blumstein, D. T, Saylan, C. (2007). The Failure of Environmental Education (and How We Can Fix It). PLoS Biol 5(5): e120doi.10.1371.pbio.0050120.
- Clarke, S. (2006, September-October). Mills and Millipedes. Connect. Retrieved September 23, 2006, from www.synergylearning.org.
- Connelly, F. M. & Clandinin, D. J. (1990). Stories of experience and narrative inquiry. *Educational Researcher*, 19(5), 2-14.
- Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Columbus, OH: Upper Saddle River.
- Finch, K. (April 19 2008). Talk on Children in Nature given at the 2008 Environmental Education Council of Ohio, Mohican State Park, OH.

Hawken, P. (2007). *Blessed Unrest: How the largest movement in the world came into being and why no one saw it coming*. NYC, NY: Penguin Group.

Henig, R. M. (February 17 2008). Taking Play Seriously. The New York Times.

Louv, R. (2005). *Last Child in the Woods: Saving Our Children from nature-Deficit Disorder*. North Carolina: Algonquin Books of Chapel Hill.

Louv, R. (2006, July/August). Leave No Child Inside. Sierra Magazine. Retrieved September 23, 2006, from www.sierraclub.org/sierra/200607/child.asp

Marshall, C., & Rossman, G. B., (1989). *Designing qualitative research*. Newbury, CA: Sage Publications.

McKibben, B. (2007). *Deep Economy: The wealth of communities and the durable future*. New York, NY: Holt Company.

Merriam, S. B. (1991). *Case study research in education: A qualitative approach*. San Francisco, CA: Jossey-Bass, Inc.

Nielsen, J. (February 1, 2008). Americans Spending Less Time in Nature. Morning Edition, National Public Radio. From a study by Pergams, O. in the Proceedings of the National Academy of Sciences.

No Child Left Inside Initiative (2007). <http://www.eenclb.org>

Orr, D. (2002). *The Nature of Design: Ecology, culture, and human intention*. New York, NY: Oxford University Press.

Orr, D. (2004). *Earth in Mind: On education, environment, and the human prospect*. Washington, DC: Island Press.

Ramey-Gassert, L. K., (1997). Learning science beyond the classroom. *Elementary School Journal*. 97(4), 433-450.

Ramey-Gassert, L., Walberg III, H. J., Walberg, H. J. (1994). Reexamining connections: Museums as science learning environments. *Science Education*, 78(4), 345-363.

Rivkin, M. (2000, December). Outdoor Experiences for Young Children. Retrieved September 23, 2006, from ERIC Digest Database (ED448013).

Sobel, D. (2001). *Children's Special Places: Exploring the role of forts, dens and bush houses*. Tucson AZ: Zephyr Press.

Standards for the Initial Preparation of Environmental Educators. (2007). National Council for Accreditation of Teacher Education. North American Association for Environmental Education, Washington D.C. www.naaee.org.

Wilson, E. O. (2006). *Naturalist*. Washington DC: Island Press.

Wilson, E. O. (1984). *Biophilia*. Cambridge, MA: Harvard University Press.

Linda K. Ramey, Ph. D.
Assoc. Professor, Environmental/Science Education
345 Allyn Hall, Wright State University
Dayton, OH 45435-0001
(937) 775-3231 office, (937) 477-8662 cell
Linda.Ramey@wright.edu

I have worked in Environmental Science Education for over 30 years and loved the natural world for over 50. I have a two Masters degrees – one in science education (College of Mt. St. Joseph) and one in environmental ecology (Wright State University). Leaving Ohio, I headed for the beautiful plains of Kansas, working on Konza Prairie and a major NSF Science and Mathematics project. I also worked at Chicago Botanic Garden on outreach science education in the Chicago City Schools. When I completed my dissertation on enhancing science teaching self-efficacy, I spent a year as a visiting professor at Kansas State University. After Kansas and Chicago, I spent a year at the University of South Carolina as a visiting professor teaching science and mathematics methods courses and working with Sandhill Environmental Research Center. I was then hired at WSU in the Biology Department in what is termed a Dual Appointment which meant I developed and taught courses in both the biology and teacher education department. Since 1995, I have fulfilled several roles at WSU such as Director of the Office of Professional Field Experiences, Coordinator of the Middle Childhood Teacher Preparation Program and Environmental Science Educator. I have had involvement with several grant funded projects as well as numerous publications and presentations in the areas of informal science education (science centers/museums), gender issues in science learning and science teaching self-efficacy. I am presently engaged in STEM and Sustainability Initiatives in the Miami Valley Region.