INTO THE WOODS:
EXPOSING CHILDREN TO OUTDOOR CLASSROOMS
A CREATIVE PROJECT
SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
MASTER OF LANDSCAPE ARCHITECTURE
BY
AMY C. LaTOMME
JODY ROSENBLATT-NADERI
BALL STATE UNIVERSITY
MUNCIE, INDIANA
JULY 2012
Acknowledgements

This project could not have been completed without the help of many individuals. First, the parents and children of Room 8 for their willingness to participate in the initial study and research which allowed the project to move forward and develop in a way that could not have been expected.

The faculty and staff of Apple Tree – especially Diana Badger, LZ Fritz, Miss Tanya and Miss Suzanne for allowing us to work with them on this project and for adjusting their schedules and teaching routines so that the children could experience the woods.

This project could not have been completed without, Kem Badger, John Taylor and the Field Station Executive Committee who granted permission for the use of Cooper Woodlands as the research site.

The faculty and staff of the Landscape Architecture Department at Ball State University for their support and constant endeavors to advance the field of Landscape Architecture.

Also, Les Smith and Jennifer Young for being supportive committee members and Jody Rosenblatt-Naderi for her role as committee chair and their countless hours spent helping to develop the project.

Finally, a special thanks to my parents for their support and guidance throughout my life.
# Table of Contents

Abstract

Acknowledgements ................................................................................................... i

Introduction ............................................................................................................ 1

Literature Review

  2.1 Children Need Nature ................................................................. 8
  2.2 Factors Preventing Children from Being Outside .................... 23
  2.3 The Importance of Children Learning Outside ..................... 33
  2.4 Forest Kindergartens .............................................................. 44
  2.5 Applications to Apple Tree ..................................................... 55

Data Collection ...................................................................................................... 57

Findings ................................................................................................................. 64

Design Narrative ................................................................................................. 87

Conclusion ........................................................................................................... 107

Works Cited ......................................................................................................... 110

Appendix

Images –unless otherwise noted all were taken or produced by Amy LaTomme
Introduction:

Into the Woods: Exposing Children to Outdoor Classrooms

“Ponds, brooks, patches of dirt, scrubby wastelands of bushes and trees, and tall manicured grass” are important features for children’s learning and development (Porteous). Unfortunately, these elements are all but absent in present-day suburbia. The landscapes accessible to children - home, school and public spaces - limit the diversity of natural and ecologically dynamic experiences children engage in and encounter.

In recent years, children have developed aversions to interacting in and with natural and less manicured landscapes. With natural landscape elements missing in their formative years, it is no wonder that a third of all children are nervous about getting dirty (Day). This limited exposure to the outdoors is affecting children so much that childcare facilities are stepping in and teaching young children how to play inside and out (Day).

Unfortunately, because of the ever-increasing emphasis on standardized test scores and a belief that more “book-learning” is necessary to improve those scores
some schools are taking recess away from children. Not only does this increase the
amount of time children spend in a structured indoor environment, it takes away a
child’s right to play and learn from play as stated in Article 31 of the United Nations
Convention on the Rights of a Child:

Children have the right to relax and play, and to join in a wide range of
cultural, artistic and other recreational activities. (Casey)

In recent years, a public educational movement to teach children in the outdoors
has re-emerged in Europe. Preschool classes, known as “wild” or forest kindergartens,
allow children ages three to five to be in the outdoors learning, interacting, and playing
with each other within natural landscape settings. These settings might include
woodlands, prairies, wetlands, etc. Typically in a forest kindergarten, the children spend
their entire day in their outdoor classrooms receiving similar education to those children
who are in an indoor preschool.

The first forest kindergarten was started in Denmark in 1950 and spread through
Scandinavia, especially Sweden (Coleman). In the 1990’s, the movement became very
popular in Germany (Weisshaar). Although these classes continue to be popular and are
spreading throughout Europe, they have been slow to emerge in the United States. The
first forest kindergarten established in the United States happened in 2007 in Seattle,
Washington.
Recent studies conducted in Sweden compared forest kindergartens to traditional preschools. The study showed that children who attend forest kindergartens have a higher attendance rate, have better concentration, have better motor functions, and play more imaginatively. (Robertson)

Forest kindergartens have been slow to emerge in the United States because of legislative restrictions, limited outdoor space, safety and health concerns and media-influenced landscape archetypes. Mandatory access to restrooms and hand washing stations; children not being able to be outside in temperatures below 25 degrees with wind chill; and children being elevated from the ground while taking a nap are just a few of the legislative restrictions. (IFSSA)

Research Question

Even with the interest in forest kindergartens growing throughout the United States, the legal limitations, along with teachers, parents and children unfamiliar with natural landscape classroom learning techniques pose challenges to implementing such programs.

This study hypothesizes that by applying evidenced-based landscape architecture design principles to a 1.75 acre site, adjacent to Apple Tree YMCA Child Development Center, located in Muncie, Indiana, many of the forest kindergarten learning opportunities can be provided.
Even though the interest in forest kindergartens is growing, the barriers that occur when implementing such projects, even at a local level, lie predominately in the preconceptions and misconceptions of the teachers and parents of preschool children. In order to address these challenges at the local level, the research question being addressed by this study arises:

“By defining the barriers and opportunities for outdoor learning at the preschool/kindergarten age level in Muncie, Indiana, what will be the best configuration and design strategy needed for a wild kindergarten?”

**Literature and Media Review**

Background literature review for this study included books, academic journals, case studies and social media (newspaper articles, blogs, etc) that investigated:

- Children’s relationships with nature,
- The lasting benefits of nature,
- Why children are not experiencing nature,
- Playgrounds,
- The spatial relationship between children and the outdoors,
- Children’s health and wellness,
- The history of kindergartens and preschools,
- Types of outdoor education,
- School curriculum and legislation,
• Forest kindergartens.

Part of the multi-disciplinary resources affecting the work, literature about parenting, and books and journal articles written about children over the age of five years old, were limited in favor of public childcare and early childhood literature.

Literature and media were also part of the data collection. The literature, both scientific and social, supported the collected observational behavior. Media, such as cartoons, video games and children’s books were used to look at landscape archetypes. Case studies about existing forest kindergartens and outdoor learning environments were read to better understand their development and limitations.

Data Collection

Data in the form of observing children in outdoor learning environments, parks, and natural areas was collected. These observations were interpreted to better understand how children at Apple Tree interacted with the outdoors and how they learned and played. Interviews and surveys given to children, teachers, and parents were also part of the observational data.

Institutional Review Board (IRB) approval was granted by Ball State University to conduct observational research of children at Apple Tree. The children were observed in their indoor classroom, on their indoor and outdoor play equipment and at Cooper Farm and Skinner Field Area (an old growth forest owned by Ball State University.)
The Cooper Farm and Skinner Field Area was selected for this study to provide a referential landscape to guide the design decisions for the Apple Tree site. The Field Area (hereinafter referred to as “Cooper Woodlands”) consists of an old growth climax forest ecosystem and a recreated prairie conserved for research use by Ball State faculty.

Geographic Information Systems (GIS) and site analysis was used at the Apple Tree site, as well as Cooper Woodlands to gather landscape cover data and topography. This data was used to better understand the ecosystems of both sites and how best to proceed with the design.

All of the data was gathered and organized to look for similarities and differences between the two sites. Recurring outliers that indicated gaps in the data were documented. The synthesis of the data, including the outliers, determined the final design of the site.

Findings

The results of the media and literature archetypal study indicated that the adults and children might be hesitant when engaged in woodland play and learning settings. However, the results of the field observations of the children and the survey of the parents and staff were not consistent with this finding. The “hesitation” was not apparent in the children’s visits to the woods or their interaction with the woods as predicted.
After completing the data collection and analysis, the data indicates that the best possible configuration for a wild kindergarten in Muncie, Indiana, will be to identify lands in the region that can be earmarked for use as forest kindergartens and, in the meantime, continue transporting the children to Cooper Woodlands or comparable landscapes.

For the Apple Tree site, an outdoor learning environment that mimics the natural environment of Cooper Woodlands is valid. The details of the scale and formation of the restoration of the Apple Tree site are developed based on the spatial information gathered in the field at Cooper Woodlands. This evidence-based landscape architectural design strategy for the planning and design of the Apple Tree site developed in this study presents a replicable method for the development of natural outdoor learning areas in Muncie’s urban sites.
Literature Review:

Children Need Nature

"We should not think of a child's experience in nature as an extracurricular activity, it should be thought of as vital to children's health and development" - Richard Louv

Contact with Nature

The loss of grass, trees, plants and play areas has become so commonplace that children in Japan have a word for it – *hiraku* (Rivkin; Banning). Every child defines nature differently; to some it is the clump of bushes near an apartment complex or driveway. To others it is a vacant lot, a city park or a small group of trees that borders their suburban subdivision (Braccidifero). (Image 2.1.1)

Children experience nature in various ways and forms as an integral part of their everyday environment. A child’s experience in nature encompasses a wide range of emotions including wonder, satisfaction, joy, as well as fear and anxiety (Kahn). Experiencing nature is essential to every child’s well-being - physically, mentally, morally and emotionally and serves as a motivator for their individual learning and development (Tai; Kahn).
For some children, direct contact with nature involves spontaneous play or activity in: a backyard, a nearby forest, meadow or creek, a neighborhood park or an abandoned lot (Kahn). (Image 2.1.2) The aimless exploration in natural settings promotes a child’s creativity, increases their self-esteem and reduces stress (Kahn). “Keep off the Grass” signs that are prominent in many municipal recreation areas signify to some that parks are only to be looked at and not enjoyed. The unintentional limiting of these areas decreases the amount of space children have to freely play in. (Clements).

The outdoors offers space to try new things. There, children have the opportunity to explore and experiment without being constrained – they can shout, sing, leap, roll, and stretch (Tovey; Rivken). In this less constrained setting, children are more likely to take physical, social, and emotional risks (Banning). These might include: climbing and walking through muddy ditches, building dens, drawing, hunting for insects, observing seasonal changes and scaling trees (Watkins). (Image 2.1.3)

Such activities build confidence and self-esteem that are generally absent in children who spend their time inside. Richard Louv, author of *Last Child in the Woods*, said,

Children who do not get out in nature lack the sense of wonder that nature provides. Children who have never been in the woods are scared because it's unfamiliar; but [when they are taken there] they open up and start exploring. (Why Kids Need Nature) (Image 2.1.4)
Health Benefits

A child’s everyday environment is an important contributor to their social development and their health and well-being (Thwaites). This generation of children may be the first generation at risk of having a shorter lifespan than their parents (Health and Environment). American children, whether living in urban or rural communities, are not getting outdoors. This is leading to unhealthy consequences for their bodies as well as their minds (Kimball).

Sedentary lifestyle and physical inactivity have contributed greatly to the health problems that plague today’s children. Chronic conditions such as childhood obesity, asthma, attention-deficit disorder, and vitamin D deficiency have all increased over the past few decades (Health and Environment). The formative influence of nature in a child’s health and development, “underscores that this connection is not just a matter of physical fitness and intellectual capacity, but also emotional capacity, identity, basic values, and even moral and spiritual condition” (Kahn).

Obesity

The rise in obesity among children can be linked to the decreasing level of physical activity. One of the contributing factors (to the decrease in physical activity) is the limited access to quality green spaces and the amount of time a child gets in unsupervised play outdoors due to worry about traffic danger and ‘stranger danger’ (Manwaring). Studies show that exercising in natural environments is associated with greater feelings of revitalization and positive engagement, decreases in tension, confusion, anger, and depression, and an increase in energy (Health and Environment).
Stress

Childhood stress has become an increasing issue of concern for pediatricians in America. The workload of school and extracurricular activities has the potential to create more stress upon a child, which can affect the child’s development. Three hundred thirty-seven rural children in third through fifth grade were studied to determine if the presence of nature would help alleviate the stresses of life. The evidence from the study showed that higher exposure to the outdoors lowered the children’s stress (Wells; Health and Environment).

ADD/ADHD

Children deprived of the spiritual, emotional, and psychological benefits of the exposure to nature maybe more prone to depression and attention disorders (Kimball). Evidence shows that exposure to natural environments moderates a child’s attention disorder. Several studies have analyzed this by surveying parents to compare their child’s attention function when engaged in leisure activities in indoor and outdoor settings. The greener the setting was, the less severe the symptoms of the child’s attention disorder were (Faber Taylor; Health and Environment).

Mental and Emotional Well-Being

A child’s contact with the outdoors and use of the natural environment, contributes to the child’s emotional and psychological well-being, including “letting off steam, shouting and running, quiet reflection, confiding in others and being with family members and pets” (Thomas). Nature can create a feeling of wholeness in a person, and many people have spiritual experiences in natural environments (Änggård).
**Biophilia and Biophobia**

The interaction with the natural world is essential to the emotional health of a child (R. White). Biophilia is a person’s biological need to affiliate with nature (Green). E.O. Wilson describes biophilia as a powerful, important bond between human beings and other living systems (Grierson). Nature supplies people with aesthetic, intellectual, cognitive and spiritual meaning and satisfaction as well as material needs (Rivken).

(Image 2.1.5) Children are born as biophilic beings because of their want to learn about the natural world without fear or intimidation (Moore, Marcus).

As children confront nature, they heighten their self-confidence and social competence. Overcoming natural obstacles (climbing trees, moving branches, arranging stones, etc.,) teaches children to trust in their abilities. Observing nature also helps in developing their sensitivity. Trust, cooperation, interdependence and respect develop out of necessity when children help each other manage their natural surroundings (Mills). When children play in nature, they are more likely to have positive feelings about each other and their surroundings (R. White). (Image 2.1.6)

Biophobia, or an aversion to nature, may develop when the natural attraction to nature is not given the opportunity to flourish or be exercised (Green). Having biophobia results in a discomfort in natural places, a dislike of places that are not man-made and may result in a view that nature is a disposable resource (Green).

The lack of experiences in nature during childhood can discourage adolescents and adults from seeking out natural places because of the negative perceptions they developed (Blizard). Childhood experiences with nature can influence an adult’s
sensitiveness to nature; this suggests that positive engagement with nature will be a crucial strategy for the protection of the natural world (Moore, Marcus).

Many adults remember outdoor environments as the most significant places of their childhood (Malone). Several research studies asked adult environmentalists to remember what circumstances contributed to their conservation values. A frequent response was their time spent exploring and playing in natural spaces. The natural spaces (vacant lots, tree houses, a nearby park, etc.,) allowed for their frequent unstructured and unscheduled play that ultimately impacted their attitude about nature (Finch).

Young children tend to respond more positively to outdoor experiences compared with adults because they have not adapted to unnatural, man-made, indoor environments (R. White). It is imperative then, that children have positive outdoor experiences, not only for themselves, but also for the protection of the natural world.

**Spatial Relationship**

A sense of place encourages the development of a child’s awareness of where they are in relation to their surroundings and what it means to them (Simkins). The experience or sense of place has the potential to promote positive behavior and encourage emotional well-being in children. Where place is a point of location, space is the realm of movement and is defined by a network of places. Places are located in nature and are separated by a background of space. A child’s notion of place may not necessarily correspond with an adult’s (Thwaites).
Unfortunately, there tends to be a lack of effective engagement with children to understand how they feel about the places they use. Typically the design focus is on the way that their parents, teachers, caregivers, architects and landscape architects, etc., think they feel (Simkins). As a result, the tendency to overlook, undervalue, or conceal a child’s experiential content of outdoor places has been recognized as a limitation in the approach to environmental planning and design for children as the primary user (Simkins).

For most children beauty is wild, while an adult’s is ordered (R. White). Adults perceive the landscape as forms while children interpret the landscape as terrain and function (I. Fjürtoft). Places and objects, that to a professional eye appear unimportant and maybe even neglected or broken, can be important to the perceptions of children for whom the places or objects take on an altogether different dimension of significance (Simkins).

If children lose their access to an outdoor environment they are deprived of the chance to develop a sense of place. Most children view going outside as a priority because they feel settled and capable in a natural environment (Bilton; White). Due to the impacts of rapid urbanization, children in many cities throughout the world have less access to natural or wild environments, especially on their own (Malone). Because most of our evolution as a species occurs outside, children need to be there (Rivkin).

When outside, most children will gravitate underneath the trees or in small, enclosed spaces because they seek out naturally occurring shelter in their environment (Kahn). (Image 2.1.7) In a study conducted by Mary Ann Kirkby, 26 preschool children
were observed playing on a half acre playground (Nabhan). The study concluded that the preschool children preferred enclosed spaces with good vistas. When children want to gain a sense of wilderness, they choose the small area, not the large (Nabhan). Such spaces appeal to children because of the space’s diversity and the feeling of timelessness.

A child’s access to nature provides a vital aspect of growing up. When designing landscapes for children, it is important to provide places where active and passive activities can be experienced in large and small groups and individually. It is in a child’s nature to investigate, examine and work to make sense of their surroundings, whether inside or out (Rivkin).

**Outdoor Play**

The observation that children no longer play outside should be taken seriously (Burdette). Along with nutrition, health, shelter, and education, outdoor play is vital to a child’s development (Stine; Burdette). “… in play [a child finds] activities and occasions for discovering himself, his strengths and weaknesses, his skills and interests, enabling him to learn to cope with situations and events appropriate to his size and strengths” (Lueck).

Sharon Stine, author of *Landscapes for Learning*, makes four assumptions about play. They are:

1. Play is the way children learn and is an essential part of their growth and development;
2. Play is not limited to young children. Adults engage in play as an essential experience throughout the life cycle;

3. Playing outside is an intrinsic need because it provides a uniqueness of experience that cannot be offered elsewhere;

4. Play environments are educational settings.

Children develop best when they have access to outdoor environments where they can play and learn through real experiences (White). Play, in an unstructured natural environment, gives children an understanding of reality (Fjürtoft). Through play, children learn about the variety and complexity of the world and about themselves (Stine). Play that involves the whole body develops a child’s physical, mental, and social health, and well-being (White). For children to gain all the benefit from playing and from the play environment, they and adults need to embrace play as broad, rich, and unpredictable (Casey).

Children’s play outdoors is different than indoor play. (Image 2.1.8) However, all play requires solving social problems “such as deciding what to play, who can play, when to start, when to stop and the rules of engagement” (Burdette). For children, play can improve aspects of their emotional well-being including “minimizing anxiety, depression, aggression and sleep problems” (Burdette).

Play at school is different from play in the local park. Play in an educational context is attached to a hidden curriculum that tells a story to the children about the culture and philosophy of the school. The way in which children can learn through play
is influenced by the design and policies that dictate the use of the school grounds (Malone).

Because activities that are discouraged inside are typically tolerated outside, children have more freedom to run and be loud while experiencing the outdoor environment around them (R. White). Children tend to chose to play in challenging and interesting places that meet their need for imaginative play (Casey). They thrive in play areas that have diverse natural elements that become their tools for developing cognitively and socially (Tai). These places may include “beaches, urban streets, back alleys, woods, cemeteries, churchyards, doorsteps, construction sites and quarries” (Casey). (Image 2.1.9) All of these provide opportunities for play that are “pleasurable, self-motivated, imaginative, non-goal directed, spontaneous, active and free of adult-imposed rules” (R. White).

The fears of child abduction, stranger danger, traffic, etc., mean that more adults are accompanying children during their outside play time. When adults are involved in children’s play, children have to follow adult rules and are subject to the adult’s concerns. The child loses the benefit of being able to create the game, lead the game and solve group disagreements when the adult is involved (Ginsburg).

Play is the heart of childhood; it is only limited by physical settings and the attitude and commitment of those around them (Stine). Child’s play should be self-initiated, self-regulated and self-motivated to allow the child to develop physical and social skills, learn cooperation, and gain tolerance for others (Knight; Watkins).
Playgrounds

“American public playgrounds are perhaps the worst in the world. They are hazardous. In addition, most playgrounds are designed as though children’s play needs are limited to swinging from bars and running across open spaces, as though children cannot think, symbolize, construct, or create” (Rivkin). (Image 2.1.10)

M. Paul Friedberg, a landscape architect and playground designer, said half a century ago:

Just as TV becomes an electronic babysitter, so do our existing play facilities become great, gray outdoor nannies, incarcerating children and protecting them from experience and involvement. The air may be fresh, but the play is stale. (Bishop)

Unfortunately, some adults believe that playgrounds should be designed to watch children, require little maintenance, and give adults a break from their children, instead of stimulating the child’s play (White).

In modern playgrounds, nature has essentially been replaced by climbing structures, mulch, pavement and other artificial elements (Banning). While important to evaluate play equipment in terms of safety, durability and pleasurableness, attention needs to be given to the function of the piece related to a child’s development (Lueck). Fixed equipment provides places to run, climb, swing and slide; however, it provides little opportunity for creative play. “Once the slide has been the space shuttle, the platform on the pirate ship, and the tower part of a medieval castle, the imagination is lost because of the static nature of the equipment” (Jost).
There is growing recognition that a playground with fixed equipment does not meet the play needs of children. If a child’s play environment is too safe, uninspiring, and repetitive, then the child will find some other way to make the play area interesting (Knight).

**Natural Play Environments**

With the limitation that static play equipment provides traditional playgrounds, it is important that natural features are provided in the play area (Fjurtoft). At a traditional playground, a child cannot dig, build or design. Children are then forced to use static equipment that does not promote creativity (Porteous). By only having manufactured play equipment in a play area, the area becomes less than ideal (R. White).

Natural play environments do not depend on manufactured play equipment, instead they rely on the landscape, vegetation, and materials to create an informal place that responds to children. (Image 2.1.11) The play area is designed to increase curiosity, imagination, and connection with nature (White). It has an unending diversity, is not made for adults and allows children to feel timeless when there (R. White). The design of the play environment is looser than other play environments because children value unmanicured places (R. White).

When compared with conventional playgrounds, the play of children in natural environments is more complex, creative and social. The groupings of children are mixed in age and gender, with few conflicts (Tovey). When playground materials are open-ended, children design their own play units and work together collaboratively (Wilson).
Some may wonder what a child can do at a playground that is devoid of equipment and commercially made toys (Wilson). Studies indicate that children actually prefer playing with stones, bricks, stumps, sand, and other materials that are found, then to the carefully designed playground equipment (Wilson). It is crucial for children to be given daily chances to interact with materials found in nature; it is not the same experience for children to go outdoors to a space filled with hard plastic and concrete (Wike).

The uneven terrain, the various climbing heights, and the obstacles placed to maneuver around at a natural play environment give children more opportunities to test their limits and to use their bodies in a wider range of movements when compared with a conventional playground (Tovey). (Image 2.1.12) A boy in kindergarten said, “Climbing rocks is more fun than climbing trees but climbing trees is more fun than the boring playground equipment” (I. Fjurtoft).

Natural materials are the best resources for outdoor play (White). When natural materials “such as logs, sticks, fir cones, leaves, twigs, and mud” are available, children are able and will transform them into whatever they want the materials to be (Tovey). (Image 2.1.13) Simon Nicholson wrote:

In any environment, both the degree of inventiveness and creativity and the possibilities of discovery are directly proportional to the number and kind of variables in it. (R. White)

Manufactured play equipment might seem safer; however, approximately 150,000 children visit an emergency room annually because of a playground injury
On playgrounds that offer only fixed play units, children add risk and challenge in order to cope with the limited choices afforded by the equipment. They jump from high places, go backwards down the slide, and find other ways of testing the limits of the play setting (Wilson).

No playground can prevent a child from being hurt; if it did, it would give an impression that children have nothing to fear from their environment (Bishop). Lady Allen of Hurtwood, a landscape architect and child advocate, told New York parents to, …sue the city for emotional damage to [your] children because [the city] failed to provide suitable and exciting playgrounds for them. Better a broken arm than a bruised spirit. (Bishop)

As long as natural outdoor environments are continued to be labeled “playgrounds,” then manufactured play equipment will continue to be installed instead of natural areas for children to play in and explore.

*Adventure Playgrounds*

In hopes of appeasing older children, adventure playgrounds began with Carl Theodor Sørenson, a Danish landscape architect, and the ruins of World War II. He and other designers, witnessed children playing among the ruins and had the idea to capture the “junk playgrounds” that were appearing. (Image 2.1.14) The principle of these playgrounds was to encourage a more natural form of play. This ideal continued to evolve to emphasize sustainability and hands-on building, which gives the children a chance to create and have ownership of their playgrounds (Urbanist; Norman).
The first adventure playground opened in Denmark in 1943. A few years later, the idea was brought to London and quickly spread through Europe, especially in Scandinavian countries. About 1000 adventure playgrounds exist in Europe; only three exist in the United States. One of the main reasons for this is the legislative restrictions, liability concerns and national standards that playgrounds in the United States must meet (Sutton).

Clare Cooper Marcus, a landscape architect, said:

It is true that [adventure playgrounds are] often rough, the structures built by children may be hazardous, tools could be used in a dangerous way--but all available evidence indicates that the children are so absorbed in what they are doing, and so cautious in attempting anything beyond their present capacities, that the accident rate is in fact lower than that on conventional playgrounds with fixed equipment. (Sutton)

Quality outdoor play environments contribute positively to young children’s physical fitness, mental development, and social intelligence (Herrington). Children need opportunity to play, not play equipment (Stine).
Literature Review:

Factors Preventing Children from Being Outside

“[With] the indoor seductions of TV, video, computer games, and DVDs, it is no wonder that young children are growing up more familiar with wireless BlackBerrys than with wild blackberries.” - Nancy Rosenow

Children Are Not Outside

“Almost three-quarters of preschool-aged children with working parents spend part of each weekday in some form of childcare arrangement” (Moore, Marcus). As a result, most children have less time outside because their parents, who would have supervised their child’s outside play, are not available (Rivken). Also, public attitude suggests that a child playing outside without adult supervision is neglected, even if they are around their own home (Casey).

When asked if children today play outdoors more, less, or the same amount of time as they did a few years ago, 85 percent of the mothers surveyed agreed that children today spend less time outdoors. Seventy percent of those same mothers said that they played outside everyday when they were young, when only thirty-one percent
of their children play outside daily (Clements). A comparison of survey results from 1981 through 1997 found that the amount of time children participated in unstructured outdoor activities decreased by four hours per week, while the amount of time indoors increased by 5 hours per week (Blizard; Wike).

The decrease in the amount of time children play outdoors is linked to a number of factors. They include: parental fears (bullying, crime, “stranger danger,” traffic, and nature); urbanization; an increase in structured, organized time; pollution; pressures of educational attainment; an increase in virtual experiences that simulate nature; and a lack of awareness about the importance of play for a child’s development and well-being (Kernon). These factors not only limit children’s outdoor play, they deprive children of essential childhood experiences (Casey). (Image 2.2.0)

**Parental fears**

Parental fear or anxiety is the most persuasive factor dictating children’s outdoor play (Tovey). The need for concern about children’s safety is paramount; however, an equal concern needs to be about how children learn, which involves risk (Banning). A safe environment needs to not only be seen as safe from harm, but also offers children safety to explore, experiment and take risk (Tovey). Within a safe framework, children will have appropriate challenges that will prepare them for a successful life (White).

Many parents work outside the home and seemingly lack the time to take their children outdoors. The ease of interactive technologies such as iPods, video game consoles, the internet, etc., draw children indoors, and allow their parents to use the devices to occupy their children in a “safe” location (Kimball). (Image 2.2.1) Fear of a
child’s safety has increased due to crime, lack of neighborhood communities and an increase in traffic (Rivkin). Many societal conditions including homelessness, unemployment, substance abuse and the access of guns, encourages the cultural trend to have children supervised outside or, even worse, for parents to keep their children indoors (Rivken).

Traffic danger is the most measureable factor that inhibits children from being outside (Moore, Marcus). Because most parents consider other cars and traffic as dangerous, the amount of children who walk to school has decreased. In most industrialized countries, children do not walk to school anymore (Rivkin). Because children who are outside alone are frowned upon, parents use their cars to transport their children to activities thus adding to the traffic congestion and perceived danger (Rivkin).

**Landscape Archetypes**

An archetype is the way that something is thought of or viewed, whether that is correct or not. It is engrained in the mind at an early age and evokes emotional responses. Film makers and authors know that specific landscapes evoke certain emotions, and will use landscape archetypes to their advantage. A raging sea, dense jungle or barren icescape suggests fear; a shopping mall, airport or office building brings to mind comfort; a view of Death Valley, the Himalayas or the Serengeti evokes a sense of wonder (McKie). (Image 2.2.2)

Unfortunately, a child’s dislike and even fear of the outdoors is often worsened by the media (Rosenow). (Image 2.2.3) In animated films, for example, the landscape of
the forest is scary, dark and jagged, while the beach is full of color, has beautiful flowers and is lit. (Image 2.2.4; Image 2.2.5) If this is the only exposure a child has to both types of landscapes, the child will prefer the beach over the woods because of the archetype the media is enforcing.

With the prevalence of television, film, and computers, along with traditional print media, children have vicarious experiences of nature based on the author’s or film director’s view of a landscape (Kahn). For some children, the only chance they will have to see and experience landscapes will be virtually, or by reading a book. Without any real experience, the archetype becomes their reality.

Children’s fairy tales are also partially to blame for the archetypal fears of the landscape. Children are attracted to stories that are set in nature and populated with animal characters. These stories have the ability to teach and shape children's attitudes through the way the story portrays nature (Tai; Porteous). (Image 2.2.6)

Fairy tales, especially collected by the Grimm Brothers, portray the forest as dark, silent, menacing, enchanted and dangerous. The main character typically gets lost in the forest, finds other outcasts (some of questionable character), and will risk their life multiple times as they become comfortable and familiar with their surroundings. (Image 2.2.7) The forest then is seen as a place to hunt, starve, encounter wild animals and people, and become lost (Porteous).
Unfortunately, this archetype of the forest is not going to quickly change because it has been engrained into the minds of children since at least the 1800s. Only recently have children’s books attempted to reverse this long standing portrayal (Porteous). Even in Walt Disney movies, the forest remains a scary place. (Image 2.2.8; Image 2.2.9)

**Technology**

Because of parental fears, limited access to the outdoors, and the decrease in their free time, the free time that children have is usually spent in front of the television or on the computer (R. White). Many adults believe that a child’s learning will be accelerated by more time with technology (Banning). Studies are finding that children are falling two to three years behind in cognitive and conceptual development; the most likely reason is the increase in the videogame and television culture and the decrease in outdoor experiential play. (Moore, Marcus).

The easiness and access to television programs, computer and video games and other technology creates reasons for children to become sedentary instead of having to think of ways to entertain themselves (Clements). The American Academy of Pediatrics (AAP) recommends encouraging unstructured play and that passive entertainment such as television, internet, and video games should be limited to 2 hours a day (Health and Environment). (Image 2.2.10)

An increasing number of young children are exposed to television programs, computer games and internet web sites that contain images and themes suitable for a
mature audience (Kahn). Something that is not scary to an adult might terrify a young 
child and cause emotional scarring. With the limited interaction children have with 
nature, it is important that the images and messages they receive portray nature 
correctly.

In the book, *The Geography of Childhood*, Gary Paul Nabhan and Stephen 
Trimble say:

> It is quite possible for today’s child to grow up without ever having taken 
a solitary walk beside a stream, or spent the hours we used to foraging 
for pine cones, leaves, feathers, and rocks — treasures more precious 
than store-bought ones. (Wike)

Children need to learn about life from life, not from virtual experiences; all the 
informative technology cannot replace an actual experience (Harward; S. Knight).

**Structured Time**

Another factor that limits children from being outdoors is the belief among 
adults that structured and scheduled activities for children will encourage the child to 
become a successful adult (White). Because young children spend more time in 
organized settings such as pre-school playgroups and childcare centers, the time and 
space for free play are being influenced and regulated by institutionalized care and 
educational agenda (Kernon).

Unfortunately, informal play in yards, gardens, pathways and other spaces 
attached to “the safe matrix of home” is being replaced (Kernon). While organized 
events like swimming lessons, soccer practice, piano lessons, etc., are valuable, if a
child’s life is over-structured, the child will never learn to rely on their own resources or develop their own brain skills (Knight). (Image 2.2.11) Their overscheduled, rushed lives, along with their lack of access to the natural world, leads to stress-related conditions in preschool aged children (Knight).

**Loss of Space**

Children should be considered the most important users of neighborhood streets; unfortunately, they are not (Moore, Marcus). Helen Penn said, “… one of the most significant changes in the urban landscape over the past century has been the disappearance of children” (Tovey). (Image 2.2.12) While wide streets, lack of sidewalks, and inadequate parks within the neighborhood discourage children from being outside, the high-speed, high-traffic streets that separate the suburban subdivision from the surrounding community are the most problematic (Handy).

In the United States, children once had access to their neighborhood elements - streets, sidewalks, alleys, vacant lots, parks, fields, and streams, with little or no restriction or supervision (R. White). Agnes Welch, a Baltimore, Maryland, City Councilwoman commented, “I moved to this neighborhood so I could send my children to the stream. Now, I have to take my grandchildren there” (Rivkin). Children’s needs are largely unrecognized and often disregarded in the emerging suburban developments.

Children derive enjoyment from small patches of garden, yard or playground and are loyal to their patches (Thomas). Children from urban areas praise the merits of their environment even as they cite examples of serious crime and vandalism that occurs
there. Children in rural areas are often negative about urban space, just as children from urban areas are negative about rural areas. The distrust of the unfamiliar comes from a degree of loyalty and ownership to their local area rather than direct personal experience of other environments (Thomas).

Richard Louv said:

In older cities, there are typically lots of green spaces, lots of unplanned areas like vacant lots ... It's not about the kind of nature children have access to; it's about children having the opportunity and freedom to explore what's in their surroundings. That may mean a city park, a farm, a patch of woods in a suburb — even a tiny roof garden. (Why Kids Need Nature)

A child’s well-being and the environmental quality that they live in are linked. The worse a local environment looks, the less likely children are able to play freely (Thomas). Suburbia, once thought of by adults as a good place to raise children, now “lacks ponds, brooks, patches of dirt, scrubby wastelands of bushes and trees, and tall manicured grass,” which are all important features to a child’s landscape (Porteous). Rough edges are the places children explore, where they find rocks and weeds and bugs. Efforts to provide nice-looking and safe outdoor spaces are well intentioned, but they give children the wrong message (Why Kids Need Nature).

Neighborhood constraints deprive children of “the right to experience and explore the world around them safely, spontaneously and on their own terms” (Moore, Marcus). Children are excluded from more and more places to play every time an empty
lot or open field is sold off for development (Casey). “How ... are children meant to develop a personal morality towards nature, if they never have access to it?” (Amandolare).

**Why Are Children Not Outside at School?**

In a study conducted by the Cincinnati Children’s Hospital Medical Center to better understand why children, specifically in childcare settings, were not being taken outside, several surprising conclusions were made. The most occurring excuse made by the childcare staff was the time that it requires to prepare the children to go outside. Other staff members used their personal attitude about being outside to dictate how their classroom was run. Some commented on the pressure they felt from the parents to teach academic skills like reading and writing instead of gross motor and social skills that children would learn more effectively outside (Parker-Pope).

Another factor preventing the children from going outside was the child’s unpreparedness. Some children come to childcare in flip-flops, do not bring coats and do not dress appropriately for outdoor play. Some teachers believe the child’s unpreparedness is an intentional act by the parents who do not want their child to be outside. Because of the unpreparedness of one child, the entire class stays inside (Cincinnati).

The most surprising reason for not going outside is the mulch on the playground. The teachers claim that the children eat the mulch, use it as weapons or get it caught in their shoes (Parker-Pope). For the teachers, it is too much of a constant upkeep and concern so they choose to keep their students inside.
A strict curriculum encouraged by childcare centers to meet state standards also limits outdoor time. By intentionally or unintentionally trapping children inside all day, children now have to “come to grips” with being outside (Tovey).
Literature Review:

The Importance of Children Learning Outside

“The training of children is a profession, where we must know how to waste time in order to save it.” - Jean Jacques Rousseau

Kindergartens

The word “kindergarten” means “child’s garden.” When Friedrich Fröbel established the first formal kindergarten in Germany in 1840, Fröbel decided to call the institution “kindergarten” to mirror his pedagogical view; he saw the child as a plant and the teacher as a gardener who was to make the plant flourish (Mills; Änggård). Fröbel believed that children needed a direct connection with nature. In his curriculum, he used the outdoors as the classroom to teach children about and how to function in an adult world. Children were to learn to love nature early, gaining their appreciation for nature through their experiences and observations (Änggård).

Fröbel’s contemporary, Jean Jacques Rousseau, believed that children should be brought up in nature to avoid the damaging influences of society. Children were to learn through their own experiences in nature rather than through instruction. Nature became a resource and a source of knowledge, and children learned through physical
interaction with the world, beginning with their closest environment and progressing to wider circles. Children spent considerable time outdoors, preferably barefoot and lightly dressed (Änggård).

By 1856, kindergartens were introduced in the United States and started to multiply rapidly. As kindergartens spread throughout the world, the underlying concept of children connecting with nature was lost. In the 150 years that have passed, children have become increasingly sedentary and spend less time outside. As a result, children are less connected with nature. The predicted long-term implications are creating a concern that nature will disappear if children do not experience it and understand its importance (Thwaites).

With over half of three to six year olds in the United States enrolled in a childcare or preschool setting, the playground at a childcare facility might be the only outdoor activity a child experiences during the day (R. White). A possible solution to the concern of children not being outside is to increase or introduce outdoor play and learning into the childcare setting.

“Essentially Trapped Indoors”

Typically in the United States, a school’s outdoor space consists of asphalt, a grass playing field and a manufactured play structure, none of which are particularly safe or educational (Rivkin). With limited space on school grounds and with an increasing emphasis on meeting curriculum standards, outdoor time (recess) is being taken away in an effort to raise test scores. As many as four out of ten schools in the United States have decided to eliminate or greatly reduce recess (Moore, Marcus).
According to Article 31 of the United Nation’s Convention on the Rights of a Child, taking away recess is against the international law in all United Nation member countries. The article states,

[We] recognize the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts. (Casey)

The UN article is challenged daily because of labor and exploitation practices, war and neighborhood violence, and the limited availability of resources (Ginsburg). A child’s right and opportunity to be outside must be upheld to encourage their development and learning (Tovey).

Inactivity and confinement in indoor spaces has lifelong implications (Casey). Studies have found that children who spend long hours in indoor classrooms without physical activity breaks tend to be sedentary at home (Clements). Anita Olds, a childcare facility designer, said,

... [the] restrictions placed on learning environments that limit opportunities for movement and active engagement contribute substantially to, if not actually cause, many so-called behavioral and learning difficulties. (Rivkin)

In contrast, when children are exposed to wide open spaces, they interact better socially and create fewer behavioral problems (Ducharme). Daily exposures to nature helps children build up their immune system, support their physical and mental health, and enables them to gain self-confidence and balance (Weisshaar). When
learning and playing in an outdoor setting, children learn more quickly, like learning more, and retain their skills and knowledge longer (Tanner). Also, children tend to have lower sickness rates, advanced motor skills, better fitness and an increase in imaginative and social play (Moore).

**School Grounds**

School grounds can be transformed into natural learning environments that provide educational value and learning opportunities (Moore, Marcus). The natural settings on school grounds can provide context for teaching and learning that an indoor classroom, textbook or computer-based program cannot (Tanner). When the school grounds are changed, it encourages teachers to utilize the new space as an outdoor classroom which reinforces and connects the children's play experiences to a formal curriculum (Malone).

Several educators have noticed that the children’s social hierarchy changed when space-defining areas of vegetation were planted at their school. The previous social hierarchy, which was based on physical strength, changed to favor children with command of language who were able to express their creativity in imagining what the spaces might be used for (Kylin).

Certain behavior or frustrations seen in the formal classroom is not evident outside. Some children will push others in the classroom but when they are outside they are able to explore and have their own space to run around. Children who are intimidated or shy when asked to speak in front of the class can be seen explaining the rules of a game to the
group. Others reluctant to engage with other children in the classroom are motivated ... to interact with others... (Watkins)

**Outdoor Classroom**

An “outdoor classroom” is a place where various types of learning occur as children interact with multiple elements in nature (Wike). Children strengthen their skills in math, science, language and literacy, visual-spatial thinking, social interaction, and body competence while having fun and developing a sense of wonder about nature (Wike). An important advantage of an outdoor classroom is that the outdoor space, as opposed to the indoor classroom, is an authentic, regenerative environment (Änggård).

In a study that included 40 schools across the United States, the majority of the 252 teachers who participated in the study noted that when the natural environment was the context for learning, the student’s performance improved in: standardized test scores, grade point average, their ability to stay on task, their adaptability to learning styles, and their problem solving abilities (Dyment). Teachers often marvel at how few behavior problems occur as children work outdoors (Wike).

Outside, children can explore natural materials in their appropriate context and in a more creative way (White). (Image 2.3.1) While outside, a child encounters opportunities for decision making, problem solving and creative thinking that does not easily occur in an indoor classroom. Because the outdoor environment is more varied and less structured than an indoor classroom, curiosity and imagination of the child is stimulated (Burdette). The outdoors need to be valued as much as the indoors as a place for learning (Lueck).
Learning in Both Classrooms

A seamless transition between an outdoor and indoor classroom is necessary so that the outdoor classroom is an extension of the indoor classroom, not a retreat from it (R. White). With a smooth transition, the outdoor classroom becomes a perfect companion to the indoor classroom because it provides an environment that enhances and extends what is taught inside (S. Knight).

When outdoor classrooms are well-planned and have open-ended time for children to explore and learn, the teachers are able to encourage and support learning across all domains (Banning). The outdoor learning is child centered and is enhanced when the curriculum is clear and the children are allowed to influence the day’s activities (Robertson). In an outdoor classroom, the teachers are given the opportunity to observe and listen to the children’s interactions with materials and other children, thus increasing the child’s independence (Banning).

How to Implement Outdoor Learning

The United Kingdom manifesto titled Council for Learning Outside the Classroom states:

Every young person should experience the world beyond the classroom as an essential part of learning and personal development, whatever their age, ability or circumstances... (lotc.org.uk)

In Lolly Tai’s book, Designing Outdoor Environments for Children, several obstacles and hurdles are given which must be overcome when establishing outdoor learning. The first obstacle is the adult’s lack of understanding. Numerous parents and
teachers do not understand or do not know of the benefits of children learning in and being in a natural environment.

The second obstacle Tai suggests is the lack of environmental experiences. If an adult has had positive experiences in the outdoors, especially in their own childhood, their willingness for their child to experience the outdoors increases.

Another obstacle is fear of the outdoors. An increasing number of adults are afraid of a child getting lost, stolen or hurt. Some are afraid of the outdoors in general, while others are afraid of more specific elements, like insects.

Time is another obstacle. Time is needed for teachers and parents to adjust their own schedules to accommodate the amount of time children need to be outside daily. Inflexibility of adult schedules is another obstacle. This requires advanced planning and cooperation of the parents, teachers and other adults involved.

The “prissy factor” is another obstacle that Tai gives. The prissy factor is when the parents, teachers and/or students do not like to get dirty or do not like to see others dirty. (Image 2.3.2) In some instances, the childcare centers will mandate a child have a change of clothes stored at the facility so that this is less of an issue.

The last obstacle to be overcome is that some teachers and parents see no need for change. Some adults do not equate disruptive behaviors, social problems or bullying with the lack of time spent outside. Others believe that the education they received was good for them, so it is good enough for their children and grandchildren.
How to Design a Natural Learning Environment

The physical design of the outdoor classroom is as important as the physical design of the indoor classroom (Wike). When starting to design a natural learning environment, a designer should consult their clients – the children. The design of the space must be collaborative and should include the teachers, the parents, the children and the designers (Tai, Casey). “Most people who care about child development know nothing about design, and most people who design know nothing about child development” (Stine).

In a recent study, children, aged 2 to 12, were asked what they wanted in their outdoor play space. They listed the following: “a waterfall, a pond with fish and frogs, animals, sweet-tasting fruits and vegetables like blueberries, strawberries, watermelons, and corn, pumpkins, scarecrows, very tall and bright flowers like sunflowers, trees to climb, and flowers to pick.” This study also indicated that the components of a natural area that hold a child’s interest the longest include: tall grasses, trees, tunnels, water, playhouse, butterflies, giant sunflowers, and loose parts like rocks, shells, and sand (Wilson).

By the age of four, children can contribute worthwhile ideas and voice their opinions effectively about the design for the outdoor environment (Moore, Marcus). Research shows that if children had the appropriate design skills, their play areas would be completely different than what most adults design for them (R. White).
Children need spaces that inspire them; spaces that they can make and call their own. Providing spaces that are well-designed gives children the opportunity to explore by themselves (Tai). Ideally, a natural play environment will never be finished, but will be in a constant state of change (Stine). Four guidelines are important to consider when designing a natural learning environment (Stine):

1. Emphasis on nature;
2. Opportunities given for physical challenge;
3. Clarity provided through consistent markers;
4. Spatial openness.

The natural play environment should not be over-planned or separated into a lot of areas (White). However, the space should be divided into areas that support different kinds of activity. There should be open spaces for mastering gross motor skills and protected, quiet spaces for resting or watching. The play zones should support a variety of groupings and interactions. Also, the spaces should be designed for playing in small groups, in pairs, or alone (Wilson).

Field testing at the childcare center will help the designer determine what areas to include and how to arrange areas in proximity to each other. Active and quiet play should be separate from each other. While these different areas should have some type of boundary, connections between them should be clearly visible and easily accessible.

Boundaries can consist of changes in ground covering, landscape elevation, or be formed by shrubs or other types of plants (Wilson). Signs and other visual cues can be
used to help children know how to use each space (Wike). Structure provided by natural materials creates zoning and flexible space to give children some direction, but still allows them to maneuver freely (White).

Natural play environments should transition from one area to the next, be simple, encourage children to use their imagination, and be perceived by the children as a child’s space (R. White). The focus of each space should give the children the possibility to choose their own activity and create their play environment (I. Fjurtoft). When the designer knows what makes the outdoors special, then they make appropriate decisions about the planning of the space (White).

The basic components of a natural play environment should include (R. White):

1. Water;
2. Ample amounts of vegetation (trees, bushes, flowers, grasses, etc.);
3. Animals and insects;
4. Sand;
5. Materials that vary in color and texture;
6. Ways to experience seasonal changes (wind, light, sound, weather);
7. Natural places to sit, lean on or against, climb and that provide shelter and shade;
8. Varying levels of places that provide privacy, socialization and views;
9. Structures, equipment and materials that are changeable.
Including all of the necessary components does not guarantee the success of the outdoor classroom. The ability that a landscape architect has in understanding the site, along with the ability to understand the visual composition and perception of the site, will make all the difference in the design (Wike). “The largest contribution a landscape architect can make is transforming a space into a place” (Wike).

When designing an outdoor play environment, plants become an important element. The selection of plants requires careful consideration because hazardous and poisonous plants must be avoided (Tai). Ideally, the plants will appeal to the child’s five senses through color, smell, touch, etc., and should attract wildlife (Tai). The plants, when selected correctly, will provide spaces for discovery, dramatic play, hiding, path delineation, and shelter (Tai; Banning). Trees and shrubs will provide shelter and objects to climb, while meadows and grassy areas will allow children to run (Fjurtoft). The variance in topography, provided by rocks and slopes, allows children to improve their motor development by requiring versatility of movement (Tovey).

Landscape architects and educators need to work together to provide outdoor settings for childcare centers and schools that really work (Wike). In essence, all a designer can do is to provide a backdrop for the children to play in (Casey). A well-designed outdoor space can help young children grow and learn in positive ways (Wike). The designer will know that the space is working when the child chooses to play there and that the play is of value to the child (Casey).
"Beulah's gone to other preschools where she's come back with paint halfway up her arm or chalk all over her shoes. It's really no different than going to any other preschool. Kids are going to get dirty no matter what."

- Alison Taylor, mother of a Cedarsong Nature Preschool attendee.

(Alfonsi)

Richard Louv’s phrase “Nature deficit disorder” has greatly impacted the attitudes of people across the United States. A sense of urgency is being felt among educators, health-care professionals and others to make nature available to children. Their best solution to this problem is to have schools become nature focused.

To give children an opportunity to learn outside, Waldkindergärten, or forest kindergartens, started in the 1950s in Denmark and Sweden (Coleman). Forest kindergartens are schools for children ages three to five years old. This age range is ideal for children to develop their values for nature (Kahn). Some forest kindergartens are
located in meadows, wetlands, prairies, or other natural environments; these different spaces allow for a range of activities that the forest cannot provide (Gypsumgirl).

Forest kindergartens have become increasingly popular across Europe. Some are called “secret gardens,” “nature schools” or “forest schools;” no matter the name, all of these schools use the same guiding principles (Harward). They are:

1. Nature provides the opportunity for children to be creative, curious and have fantasies because there is space for their personal development;
2. Children gain an appreciation for nature, based on their direct sensorial contact with it;
3. The forest is an ideal place for children to freely move about, aiding in a child’s development of self confidence and trust;
4. Through the daily routine of unstructured play in nature, children learn sociality and how to resolve conflicts (Moore, Marcus).

In the 1990s, the forest kindergarten concept became very popular, especially in Germany (Weisshaar). This concept is becoming a world-wide phenomenon with forest kindergartens forming in New Zealand, Australia, and the Middle East. Out of the more than 1000 forest kindergartens, about 700 are in Germany (Mills). In the United States however, there are less than ten, the first was established in Seattle, Washington.
Curriculum

The parents who send their children to forest kindergartens want their children to develop a relationship with nature at an early age. In the forest, children have to rely on their imagination instead of plastic toys (Wessel). “...they have to find their own toys [and be] much more creative. They experience their fundamental senses as they learn the meaning of cold and warm and play with mud; the forest is a great place for children to catch up if they have sensory deficits” (Wessel). The forest classroom naturally encourages children to gain a wide range of skills they will need throughout their life (Mills). (Image 2.4.1)

Children and their teachers in a forest kindergarten spend their day, typically four to six hours, outside in all weather conditions. If the forest does not have a shelter, the teachers will bring along a portable shelter in case of inclement weather (Weisshaar).

During the day, “...the children are guided by their own interests and the natural events of the moment. Some days they might make it to the pond to catch tadpoles and watch the swallows, some days they might follow fox tracks in the snow and some days they might do nothing but roll down the hill in cushions of autumn leaves (Finch).” (Image 2.4.2)

There’s very little “formal” teaching in forest kindergartens, children are allowed to figure things out on their own, with minimal structured oversight (Grierson). Academics are not taught in the traditional way, but the children learn counting, singing, how to use their hands to create things and how to get along with each other
(Coleman). Commercial playthings or typical teaching materials are not needed; acorns, sticks, leaves and other natural objects become tools for dramatic play, science experiments and math manipulatives (Mills). (Image 2.4.3)

When the teachers are good at their craft, the daily excursions have no agenda, no prepared lectures, and no list of birds to identify (Finch). A parent of a forest kindergarten attendee said, “There are no flash cards or worksheets. My child doesn’t realize they are learning; it happens so naturally” (Mills).

Weather

Forest kindergartens are unique because the classroom is outside in all weather. Other preschools or daycares may allocate one outdoor session per week or month depending on when they feel it is appropriate. Forest kindergartens operate on the assumption that, “there is no such thing as bad weather, just bad clothing” (Mills). Despite parental fear that exposure to inclement weather sickens children, it is the experience of forest kindergartens that children who regularly spend their time in the open air (properly clothed) stay healthier than those kept indoors (Mills). (Image 2.4.4)

Benefits

A study was conducted in 1997 in Sweden that compared children in a traditional preschool setting and children who participated in a forest kindergarten. The following results were found (Robertson):
1. The difference in the absent rate due to sickness was different by 5% with the forest kindergarten children having the higher percentage of attendance;

2. The children of the forest kindergarten had better concentration;

3. The forest kindergarten children had better motor functions;

4. The forest kindergarten children played more imaginatively.

Children participating in forest kindergartens have better coordination, balance, strength and agility, are happier, have more developed social skills, and have better attention spans (Tovey, Watkins). (Image 2.4.5) Other studies have found that children who participate in forest kindergartens have increased motivation, increased concentration, lower stress levels, increased creativity, better thinking skills, and have a compassion for nature (Knight).

A 2003 study conducted by the University of Fribourg found that forest kindergarteners preformed as well as their conventional peers on their fine motor skills and significantly better on tests of gross motor skills and creativity (Mills). Katherine Scharff, administrator of the Waldorf School at Saratoga Springs has observed that the forest kindergarteners at her school do not seem to get as sick as often as the indoor kindergarteners (Coleman).

“Many [people] seem to think you need to be in the countryside to be able to [have] a forest kindergarten when in fact, you don’t. It’s true that finding natural spaces can be more challenging [in an urban setting] but it’s vital that children growing up in
the city also have access to learn through nature too. How else are children in the city meant to develop a personal mortality toward nature if they never have access to it…?” (Watkins).

**Case Studies**

The first traditional forest kindergarten established in the United States was in 2007 in Seattle, Washington. Since Cedarsong’s debut, other forest kindergartens have been introduced throughout North America. The following are eight examples of forest kindergartens found in North America. Nature-based preschools, Waldorf or Montessori schools, and schools with natural learning centers were not considered for this study. (Image 2.4.6) (Figure 1)

*Cedarsong Nature Preschool*

Located on Vashon Island, Washington, Cedarsong Nature Preschool is about a five minute ferry ride from downtown Seattle. The school was founded by Erin Kenny and Robin Rogers. Kenny is “passionate about connecting our youngest children with nature so that they can develop early a lifelong compassion for the natural world.” (Wilson) (Image 2.4.7)

The Cedarsong motto is “Children cannot bounce off the walls if we take away the walls.” The seven 3 to 5 year olds in each class learn about plants, play in mud puddles, and learn to be self directed in 5 acres of native Pacific Northwest forest.
The school is run daily; however, a student can only attend four days of school per week. The school day is three hours in length starting in the morning or afternoon depending on the age of the student. The curriculum is “interest-led, place-based, experiential and seasonal.” (Cedarsong) Kenny has become certified in forest schools by taking the training offered in Europe and now offers the training in the United States.

**Mother Earth School**

Mother Earth School is located on Tyron Life Community Farm in Portland, Oregon. The farm is seven acres of permaculture that borders a 650 acre state forest. The school was started in 2007.

Mother Earth bases its style of teaching on Waldorf Principles, but is not a Waldorf school. They believe that each child is special and needs a personal connection with nature. Being located on a farm gives the children opportunities to work and learn how to support themselves.

Their learning curriculum is based on “practical life work and the rhythms of the seasons; enlivening the senses and cultivating confidence, creativity, a sense of place and a relationship with the natural world.” (motherearthschool.com) (Image 2.4.8)

**Carp Ridge Forest Preschool**

Located in Ontario, Canada, Carp Ridge Forest Preschool is the first forest kindergarten in Canada. It is located on 190 acres and is part of the Carp Ridge Learning Center which focuses on eco-wellness. The forest kindergarten was established in 2008. (Image 2.4.9)
Their mission statement is “To execute a holistic forest preschool program, which will illicit in each child a strong sense of the imagination, empowerment, increased mobility and motor skills, respect for self and for others, healthy living, and environmental responsibility.” (http://carpridgeforestpreschool.blogspot.com/)

**Waldorf School at Saratoga Springs**

In September of 2009, the Waldorf School at Saratoga Springs, New York, opened a forest kindergarten. The class consisted of twenty-three 3 to 6 year olds spending three hours outside no matter the weather. The school uses 325 acres of state park land known as Hemlock Trail (Leyden).

In cases of extreme weather, they take shelter in a refurbished farmhouse with a kitchen, two child-sized dining tables and two mud rooms (Rappaport). Because of its location in upstate New York, teachers and parents check children several times a day for ticks. A parent of a forest kindergartener, Barbara Collins said, "It's part of life upstate. I wouldn't want to keep my kids indoors because of ticks.” (Rappaport) The children have other daily mishaps including bruises, bumps, and scrapes (Rappaport). (Image 2.4.10)

Donna Behan another parent of a forest kindergartener commented, "I always joke that the only gripe I have with the Forest Kindergarten is the amount of laundry I have to do. I warn new parents to be prepared for dirty clothes." (Rappaport)

**Carbondale Waldkinder Preschool**

Carbondale Waldkinder Preschool, in Carbondale, Colorado, was the fifth established forest kindergarten in the United States. Karen Walker, founder of the
school, said, “As a mother, educator and Carbondale Waldkinder’s founder I have always held the belief that spending time in nature improves children’s health, stimulates creativity, sharpens thinking skills and creates well-adjusted children who will care about our planet.” (http://carbondalewaldkinderpreschool.blogspot.com/)

The children at the Waldkinder have a picnic lunch and take naps outside daily. They climb rocks, play in the snow, ride bicycles and collect items for art projects. The school believes that “the combination of imagination and knowledge is a powerful force. Waldkinder Preschool aims to build strong pathways to both.” (Image 2.4.11)

**Woodhaven**

Woodhaven, located in Beaverton, Oregon, has a once a week forest kindergarten. On Fridays, the four year olds spend all day in the woods next to the preschool’s property. The students get dropped off and are outside all day until pick up time at 12:30pm, never stepping foot in the indoor classroom. Because of its success, the program will increase to more days a week and will include a broader age range (Silverman). (Image 2.4.12)

The main goal for the teachers at Woodhaven is to give the forest kindergarteners “a love of nature that will guide them as they grow, and instill in them the self-confidence that comes from knowing their way around the outdoors.” (Silverman)

**Butterfly Garden**

In Cedar Point, Texas, a mother decided to start a forest kindergarten in her suburban neighborhood. The Butterfly Garden has been so successful that a full time
program is going to be offered at a new location in the Austin, Texas, area. Currently, the forest kindergarten program is offered for free to 3-5 year old children for three hours a day.

Butterfly Garden is based on Waldorf principles and operates on the belief that “creativity, nature, and play are the inherent right of every child and offer abundant learning opportunities. Incidental learning and hands-on experiences in outdoor natural setting is the focus of the program.” (http://s323449960.initial-website.com/about-this-school/) (Image 2.4.13)

Earthroots Field School

Earthroots Field School is located in Trabuco Canyon, California, about an hour drive from Los Angeles. Two different classes are offered at Earthroots. One class uses O’Neill Regional park located near the school. The other class changes location every week. Each class is limited to ten students to encourage a better connection with the local environment. (Image 2.4.14)

While safety and nature connection are the school’s top priorities, Earthroots meets California’s kindergarten state standards, and is a state-approved vendor for charter schools. (http://www.earthrootsfieldschool.org/)

Successful Forest Kindergartens

No matter the location, all forest kindergartens succeed on the principles that:

1. A child will be motivated and have a positive attitude towards learning;
2. Will accept opportunities to take risks and make choices;

3. Initiate learning while they develop their confidence and self-esteem. (Tovey)

Forest kindergartens are successful because they believe that children are competent, capable, curious, adventurous and imaginative human beings (Tovey). When children participate in the forest kindergarten movement, they become healthy, competent, resilient, resourceful, and imaginative children (Tovey). (Image 2.4.15)
Apple Tree YMCA Child Development Center is making great strides in their effort to promote and give children opportunities to have access to nature. Like other daycare centers across the United States, Apple Tree has to overcome the same obstacles and barriers that are preventing similar facilities from being or going outside.

Already mentioned barriers and restrictions that greatly impact Apple Tree include: the unpreparedness of children, parent and child fears, faculty and staff aversion to the outdoors, standardized curriculum and the disbelief that being out in nature will influence children for the better.

Three to five year old children are impressionable and need regular access and exposure to nature. A repeated exposure to nature helps develop a sensitiveness to nature, improves children’s behavior and improves their social and cognitive skills.

Recently, at the Muncie-community level, an awareness and emphasis on children’s health has occurred. Because of the connection of children’s health and well-being to nature, and the community awareness of this connection, the local educational
system now has the opportunity to be altered, especially at the daycare and preschool level.

By being willing to design an outdoor learning environment based on the principles of forest kindergartens, Apple Tree has given itself an advantage in the community. By having an outdoor learning environment, the Apple Tree attendees can have access to a natural setting on a daily basis; other daycares and preschools in the surrounding community do not have such a luxury.

As the design for the outdoor learning environment is developed, several key issues will need to be remembered. First, children prefer wild settings over organized, manicured settings. Wilder settings give children opportunities to explore, manipulate and find places in the environment to call their own.

Another aspect is to encourage a sense of timelessness. Although the site will be regenerative and sustainable, and will be constantly changing, the children will feel that the space changes with them, instead of being static like their indoor classroom.

Also, as the outdoor learning environment is designed, the needs and wants of the children should take precedence over the desires of the Apple Tree staff. By allowing the design to be based on the children, the design will be for them, not about them.

As the children at Apple Tree become comfortable and confident in the outdoors, their love and appreciation for nature will increase as well as their desire to protect, manage and be in nature.
The overall purpose of the observational research was to gain a better understanding of how to design an outdoor classroom that promotes learning and is conducive to the educational and emotional needs of the preschool children at Apple Tree YMCA Child Development Center.

Because observational research needed to be conducted, Institutional Review Board (IRB) approval was sought after and received. IRB is a peer-review committee that protects the rights and welfare of humans involved in research at Ball State University and other research institutions. (Appendix)

There were three distinct objectives to the research:

1. Understand how to design outdoor learning environments based on how children perceive indoor learning spaces and various landscapes, both real and archetypal;
2. Establish contextual parent and teacher attitudes about the outdoors and outdoor learning environments;

3. Understand children’s spatial relationships in the outdoors and in typical indoor classrooms.

The research hypothesis was that a child’s spatial cognition is primary to their learning environment.

**Description of Subject Population**

To begin the research, a letter to the administration of Apple Tree that requested permission to perform the research was sent. Their response to the research was affirmative. (Appendix)

Three subject groups were then chosen and used in the research:

1. Three to five year old children at Apple Tree;
2. Parents of three to five year olds at Apple Tree;
3. Apple Tree educators and administrators.

The first research subject group was the 3 to 5 year olds enrolled at Apple Tree. Because of the want to establish a forest kindergarten at Apple Tree, the children observed were the same age as in the case studies used in the literature review. One classroom at Apple Tree, consisting of seventeen 3 to 5 year olds was chosen by the Apple Tree director for the study.
The second research group was the parents of the three to five year olds in the specific classroom at Apple Tree. The parents were asked to participate in a survey that established their contextual attitudes about their children related to the outdoors.

The third research group was the daycare teachers, staff and administration of Apple Tree. They were given the same survey as the parents and were asked to participate. They, the administration, also recommended the classroom that was used in the study.

**How the Participants Were Chosen**

The criteria used to determine the participants of the study, was their enrollment at Apple Tree. Out of seven classrooms of 3 to 5 year olds at Apple Tree, the administration recommended a specific classroom for the study. The members of the classroom did not have to participate in the study; parental consent was necessary for the classroom observations. If the parent of a student did not want their child to participate, the child was transferred into another classroom.

**Wild Kindergarten Studio**

In the fall of 2011, a Wild Kindergarten Design Studio was formed at Ball State University. The studio’s objective was to design a Wild Kindergarten that would meet the needs of the children at Apple Tree, while still remaining true to the fundamentals of European wild kindergartens. The professor, teaching assistant and the nine
undergraduate students that participated in the Wild Kindergarten Design Studio received the needed IRB approval to conduct the research.

**Methods and Procedures**

The methods and procedures of the study can be divided into four subject areas: existing research; contextual attitudes; observations; and environmental analysis.

*Existing Research*

To begin the research, case studies and existing research about wild kindergartens, reforestation, prairie restoration, and legislative restrictions of daycare facilities were explored. Literature and media was examined to better understand the role of the landscape archetypes.

*Contextual Attitudes*

The next phase of the research was determining the contextual attitudes of the people involved in the study. The purpose and reason for the research was presented to the daycare faculty and staff and the preschoolers’ parents. This was done at a meeting where a brief informational survey was handed out to them. The survey was used to determine their comfort level with nature and with their children being outside. Also at the meeting, the role of their participation was explained. (Appendix)
The next portion of the research was an archetypal study, conducted by the Wild Kindergarten Studio, to establish children’s possible perceptions of landscapes. Each undergraduate student explored an animated film looking for how the movie expressed adventure, curiosity, joy and fear in the landscape.

A flashcard game was developed and conducted to establish the children’s preferences to the outdoors. The pictures on the flashcards were either animated or existing landscapes. The children were asked by the researcher to discuss each picture, whether they had been in a place like that before, did they like the picture and what would they do if they were in that picture. (Appendix)

Observations

The first set of observational behavior research was conducted in the indoor classroom at Apple Tree. The visits in the indoor classroom established a student-teacher and student-student relationship between the observers and the children. The observations took place during regular business hours of Apple Tree.

The Wild Kindergarten Studio students (now referred to as researchers) interacted with and recorded the children’s movement in the context of an indoor classroom environment. The researchers recorded clustering, group size and movement patterns. They also took notes and sketched the children’s interactions with themselves and with others and the spatial relationships inside the classroom. (Image 3.1) The researchers also interacted with the preschool students individually and in groups while
the teacher was present. The observations were mapped according to Clare Cooper Marcus’ book, *People Places: designing guidelines for urban open space* (1997).

The second round of behavioral observations was observing the children experiencing their outdoor playground. These observations took place during regular business hours. The researchers recorded the children’s movement in the context of the outdoor environment. They recorded clustering, group size and movement patterns. They also took notes and sketched the children’s interactions with themselves and with others and the sequence of spatial relationships in the outdoor setting.

The final set of observations occurred at Cooper Farm and Skinner Field Area. Again, the observations occurred during regular business hours. The researchers recorded the children’s spatial relationships, how the children interacted in the woods and how they related to each other in a wooded outdoor space. The data was recorded in the same way as the previous observations. (Image 3.2)

*Environmental Analysis*

Cooper Farm and Skinner Field Area, a Ball State University owned research field station, operated by scientists and landscape architects, was used as the research site. The researchers were able to observe the preschool-aged children in an old-growth forest, known as Cooper Woodland, while the faculty conducted controlled research studies.
An environmental analysis of the 1.75 acre site at Apple Tree and at Cooper Woodland was conducted. GIS, an analytical tool frequently used by landscape architects, was used to overlay existing conditions of the site, soil characteristics, utility lines, and other information. (Image 3.3)
Findings

Results from Data Collection

The data collection was conducted in three phases: contextual attitudes; environmental analysis and behavior observations. Each of these categories will be separated into the various forms of data collection with their resulting findings.

Contextual Attitudes

Attitudes about the outdoors vary from person to person. These attitudes are based on previous experiences and exposure to nature. If the experiences were bad, the person will not want to be there, or let others they are responsible for be there. The implementation of the wild kindergarten in Muncie hinges on the attitudes of the adults involved.

Parent Survey

A parent and faculty survey was administered to the parents of the children participating in the study and to the faculty at Apple Tree. The survey was used to determine general information, the adult preference to the outdoors, prohibitors to the
outdoors, comfort level in various densities of the landscape and their child’s favorite places. Forty-one surveys were returned and evaluated. (Appendix)

**Survey Context**

The first page of the adult survey established the initial data set. Of the parents and faculty surveyed, 85% of the forty-one participants worked outside the home, 73% were female and 57% were between the ages of 19-30. (Image 4.1)

The next set of questions asked about the adults’ habits in relation to the outdoors. The term “outside” was not defined. Eighty percent of those surveyed were outside for at least half an hour every day and liked being outside when they were there. Seventy percent had their child outside when the child is at home. Seventy-five percent were outside with their preschool aged child for at least 30 minutes per day. Ninety-five percent liked their child to be outside and to be there with their children. (Image 4.1)

**Things in a Neighborhood**

The “Things in a Neighborhood” section of the adult survey was used to establish factors that might be preventing, encouraging or have no effect on taking their children outside. Questions were asked about weather, traffic, child supervision, landscape features and the overall attitudes of the adults. When the factors were grouped together, some interesting results appeared. (Image 4.2-4.4)
The first set of factors was about transportation. One question asked if needing a vehicle to get outside prevented, encouraged, or had no effect on taking their child outside. Seventy percent of the adults surveyed said that needing a vehicle to get there had no effect. The proximity to home encouraged the responders, while railroad tracks, and busy streets and intersections near the site prevented the parents from taking their child outside.

Another section questioned the adult supervision of the child. Seventy-five percent responded that the lack of adult supervision would prevent them taking their child outside. Almost 90% answered that the presence of adult supervision encouraged them to take their child outside. Sixty percent responded that their child playing without a peer had no effect on taking their child outside.

The next set of questions asked about weather conditions. The data shows that icy conditions have an effect on whether children are taken outside. At least half of those surveyed responded that wet, hot, cold and sunny conditions have no effect on their child being outside. What does prevent their children from being outside is improper clothing.

According to this data set, weather does not matter, but clothing does. This is a valuable piece of information considering that a forest kindergarten is outside all-day no matter the weather. The day care facility and the parents will need to ensure that their children are properly clothed for their outdoor excursions.
Landscape features was another part of the *Things in a Neighborhood* section of the survey. The adults preferred to have trees and open fields when they take their children outside. The presence of water had no effect.

The last questions dealt with the feelings of the parents. The parents responded that feeling too tired and being too busy prevented them from taking their child outside.

**Picture Preferences**

The next section of the survey showed six different landscapes that varied in density. The adults were asked to rank the pictures from highest to lowest according to whether they would explore the space by themselves. (Appendix)

The results of this data were not surprising and correlated with the *Things in a Neighborhood* data set. The parents preferred to be in a landscape that was slightly enclosed with trees and open fields. The ground condition greatly affected the preference to the picture. When a path or way to get through the landscape was obvious, that picture was preferred. The pictures that had a dense understory or no noticeable path were not preferred. (Image 4.5)

The next page of the survey showed the same pictures and asked if the adults would let their child be in that picture during school. The results of this set of data were very interesting. According to the data, the parents were more willing to let their child be in spaces that they did not want to be in. Again, the preferred pictures indicated trees with open fields as the preferred landscape. (Image 4.5)
**Favorite Place**

The last page of the survey asked the parents to name their child’s favorite place inside and outside and then list fearful aspects of the woods. The child’s favorite place inside was the family/living room or their bedroom. The favorite place outside was their backyard. This data shows that children like to be in spaces where they are comfortable, that are familiar to them, and that they can call their own. (Image 4.6)

The recurring concerns of the woods were: bugs – especially ticks; plants – especially poison ivy; and animals – especially snakes. This data was not surprising, but gave indications as to the fears that the teachers of the preschool students should be prepared for. (Image 4.7-4.8)

**Archetypal Study**

Another way used to find the contextual attitudes about the landscape was to explore children’s literature and animated films. The hypothesis was that the child or parent bases their fear of the landscape on descriptions and images in books and movies.

To identify these attitudes, undergraduate students from the Wild Kindergarten Studio conducted a study looking at animated films. They specifically looked for how the landscape was used to depict adventure, joy, curiosity and fear.
Each student chose a different animated film and came up with the same basic conclusions. They concluded that joy was represented by vivid colors and lush landscapes. Curiosity was represented by small openings that looked into a bright vivid expansion of the landscape. The dark, dreary and sometimes jagged landscape portrayed fear. (Image 4.9)

Children’s fairy tales also play a large part in the contextual attitudes about landscapes. Snow White, a Grimm Brothers’ Fairy Tale, illustrates this fear:

... So he left her by herself; and though he thought it most likely that the wild beasts would tear her in pieces, he felt as if a great weight were taken off his heart when he had made up his mind not to kill her but to leave her to her fate, with the chance of someone finding and saving her.

Then poor Snow White wandered along through the wood in great fear; and the wild beasts roared about her ...

Believing that the woods are dangerous, the huntsman left Snow White to her fate. Fortunately, Snow White was safer in the woods than she was in her father’s castle. Because of this story, and others similar, the fear of the woods is long standing and will be a struggle to overcome.

Name Your Place

The “Name Your Place” game was developed to understand the children’s preferences to different landscape features. Images were gathered that represented
things in a landscape that could be built. The images were real and illustrated. Each image was placed on a card, and was shown to the preschoolers, one image at a time.

Some children were able to differentiate between the types of images; but for most, it was the content of the image that determined their preference. Some of the images of the landscape were familiar to them, other images of the landscape they had not encountered before. (Image 4.10)

The preference of the images correlated with the archetypal study in that if the image was dark, the children were scared and did not want to be in that place. If the image was well lit, the child wanted to be there. Also, the children preferred the pictures with trees and open space, like their parents.

Environmental Analysis

An environmental comparison between the Apple Tree Backyard and Cooper Woodland was conducted. This was to find the similarities and differences between the sites and was used to determine if the old growth forest of Cooper could be replicated on the Apple Tree site.

Apple Tree Backyard

The Apple Tree Backyard is a 1.75 acre site that is west of the indoor day care facility. To the south is an alley that is shared by Mainstreet Market and Rural King. To the north is Sugarbush Apartments. (Image 4.11)
The site itself has fence along the north, east and west sides. Two of Apple Tree’s play areas share the east fence. The site has noxious weeds, thorns, very little color and compacted soil. The site is relatively flat, sloping to the northwest. During large amounts of precipitation, the northeast corner has standing water. The site itself is currently being used as a place for the Rural King supply helicopter to land. In order for the helicopter to land there, the area is kept mown. (Image 4.12)

The roof of Apple Tree’s facility has improper drainage and causes flooding to the outside. This is a problem because of regulations that do not allow standing water on the playground area. To alleviate this problem, Apple Tree installed drains outside the classroom exterior doors.

The volume of stormwater from the roof is roughly 13,000 cubic feet in the first inch of a 50 year storm event. Best practices call for detention and filtration of the stormwater before it enters the city water system. There is enough room on the site to detain and provide filtration for the stormwater from the roof.

Cooper Woodland

Cooper Farm and Skinner Field Area is a field station owned and operated by Ball State University. As a field station property, its specific use is research. This location was used because of its close proximity to Apple Tree and because of its old growth forest and restored prairie ecosystems. (Image 4.12)
The portion of Cooper Farm and Skinner Field Area that was used for the study is known as Cooper Woodland and is 15 acres in size. The old growth forest has a path that meanders through it, making it accessible to all children. It provided a landscape full of possible outdoor classrooms because the trees and other vegetation formed natural edges and walls.

The vegetation in Cooper Woodland is a mixture of ash, oak and maple trees. It also has wild flowers, sedges and grasses that provide a varied ground cover throughout the seasons. Because of the native aspect that is maintained, poison ivy is prevalent during the late spring and summer months. The woodland floods during heavy precipitation; this causes a heavy mosquito and tick population during the spring and summer seasons. (Image 4.12)

Classrooms in Cooper Woodland

In preparation for the preschoolers’ initial visit to the woods, the Wild Kindergarten Studio visited Cooper Woodland. The undergraduate students were asked to identify rooms within the forest based on edges, both physical and visual. The students were given walkie-talkies so that they could communicate with each other while exploring the forest. Three classrooms were initially identified by the undergraduate students. The classrooms were marked with surveyor’s tape so that they could be easily recognizable. Two other classrooms were later identified by the preschool students during the subsequent visits. (Image 4.13)
One classroom that was found by the undergraduate students was a fallen log that has deteriorated in the middle. The undergraduate students thought this would be a good area for the preschoolers to develop their gross motor skills. The log provided a place on which the children could walk, balance, climb and test their own fears as they mastered it. (Image 4.14)

Another classroom was formed by a large tree with fallen logs that provided a seating area. The classroom resembled the “waldsofas” that are common in European wild kindergartens. A waldsofa or “forest couch” acts as a central gathering place for a wild kindergarten. As the seasons progressed, this classroom at Cooper Woodland became underwater. It then became a place where the children experienced and played in water instead of a place to wait and gather. (Image 4.15)

The last classroom identified by the undergraduate students was a part of the forest that did not have physical barriers, but had visual ones. There were several fallen logs that acted as edges; however, the children did not seem to notice because of the spacing between the logs. This classroom ended up being used for hide-and-seek. (Image 4.16)

The two classrooms that were discovered by the preschool children occurred during later visits to Cooper Woodland. As the children felt more comfortable with the woods, and as the adults loosened their control, the children were allowed to explore on their own.
The first classroom discovered by the preschoolers was close to the fallen log classroom. This classroom had several fallen logs as well as standing water. Although similar to the two other classrooms, this gave the preschoolers an opportunity to explore water and a fallen log at the same time. The roots of the fallen log made a space for the preschoolers to climb in and around, similar to a den. (Image 4.17)

The second classroom that the preschoolers discovered had defining edges due to fallen trees and limbs. When the preschoolers found this classroom, they unknowingly stayed within the walls that the classroom naturally had. A defining feature of this classroom was a tree that had fallen to form an arch. The top of the arch was about 8 feet high. The children were initially scared to climb it, but once a couple of them did, the rest joined in. (Image 4.18)

Observations


Indoor Classroom

The indoor classroom observations occurred first. This was to ensure the familiarity with the mapping exercise as well as gain a comfort level between the preschoolers and the undergraduate students. The undergraduate students recorded
the grouping of the preschoolers and how they interacted with each other. Because these observations occurred first, they became the observations to which the other observations were compared. (Image 3.1)

The preschool children are used to behaving in a certain way within their indoor classroom. They know what stations they are allowed to be at and how many of them can be there at one time. They know when snack time is and when it is nap time. Their day is completely scheduled and regulated. Because of this structure, their behavior within the indoor classroom is very structured and regulated as well.

The rules of the indoor classroom are known by each child; as a result, they govern themselves and each other. The idea of structure and regulation is important to understand because it explains how and why the preschoolers grouped themselves socially and why they were interacting with each other in a certain way.

**Playground at Apple Tree**

There are two playgrounds at Apple Tree that are used by the three to five-year-olds. One is referred to as the truck pit. The truck pit has a concrete area where children play with tricycles and other larger play elements. The other is a typical playground structure that was installed a few years ago. (Image 4.19)

Observations were conducted on the playground with the large play structure. These observations were to establish how the children played outside. The rules that
govern the playground are different than the indoor classroom and let the children act and socialize differently.

While on the play equipment, the children know what they are allowed to do. In ways, this is very similar to the indoor classroom. There are rules for the equipment that are enforced and regulated and the teachers are typically the regulators.

The children tended to hide in the small spaces of the playground. They typically played in groups of three to four. This is a reflection of the indoor classroom because at most indoor stations, they are only allowed to be in groups of two or three.

*Cooper Woodland*

After the indoor classroom and playground observations, the children were taken to Cooper Woodland on three different occasions. The first visit was with the undergraduate students from the Wild Kindergarten Studio. The subsequent visits were with the author and the children’s teachers from Apple Tree.

In order to get to the woodland, a 14-passenger activity bus was taken. The class was divided into two groups. There were two adults on the bus at all times and there were two teachers in the woods with the children at all times. The seventeen children had to be taken in two groups due to daycare regulations and limited seating on the bus.
Visit 1

The first visit to Cooper Woodland was in November. The leaves on the trees were a golden color and there were lots of leaves on the ground. The children were dressed in cold weather gear. The children clung to the teachers and undergraduate students and stayed in a line as they entered the forest. They were very careful to stay on the path. While walking on the path, some of the children were curious about the trees and plants, but were too nervous to touch them.

As the preschoolers approached the fallen log, one of the classrooms identified by the undergraduate students, the children were unsure of what they were allowed to do. They asked for help to get on and off the log and were scared to try to play on it. They all clustered in a couple of areas of the log that were very close to the ground.

As they became more comfortable on the log, the children began to be less clustered and allowed each other space to maneuver. The children were very aggressive as they were climbing on the log, almost acting like this opportunity would be taken away at any minute and that they needed all the time they could get on the log. They were at the log for at least twenty minutes and would have stayed there longer. (Image 4.20)

So that the children could experience all of the identified classrooms, the group was moved to the waldsofa classroom. The children were asked to identify the corners and the edges of the classroom. A few did this exercise, but as more and more were
called upon they went and stood next to their friends instead of identifying a wall or corner. (Image 4.21)

One of the preschoolers decided to pick up a branch and wanted to build something with it. All of the classmates joined in to build a house. Although the branches were bigger than they, the preschoolers were aware of each other and of the branches so no one got hit by a branch. (Image 4.22)

Once the house was built, the children were then taken to the hide and seek area. One of the undergraduate students was the seeker. The children hid behind logs and in hollowed stumps, usually in groups of at least three or four. Once found, they would hide again immediately. (Image 4.23)

This classroom was where the children were allowed to run free because there was a greater visual distance. In this space there were not things to manipulate or move, but the children began to understand their connection to the woods. They also began to explore on their own and were not afraid to.

The first visit to Cooper Woodland was successful. The preschoolers were given an opportunity to go into the woods and personally experience it. In retrospect, the teachers and undergraduate students were very much in control of this visit. However, by the end, the teachers and undergraduate students learned to not be overbearing or overprotective, but to let the children learn and experience on their own.
Visit 2

The second visit to the woods happened in early February. The day was chilly and the children were again dressed in their winter gear. Another entrance into the woods was used in order to have direct access into the woodland. The paths in the woods were very muddy. This gave the children an excuse to leave the paths.

The children followed the teacher into the woods, and then were allowed to direct where they wanted to go. They initially stayed in groups and were fascinated by the lack of color in the woods at the time. The children, unknowingly, found the log with the deteriorated middle. They were allowed to climb and master the log without the aid of adults.

This time, the children were not as timid and were willing to climb the other side of the log which is very high off the ground. At some points, a preschooler was higher than the teacher could reach. The children learned that they were safe, even if they were not within the reach of an adult. (Image 4.24)

Some of the preschoolers were bored and moved off the log to find another area. They found another fallen log that had made a cave with its roots. Only a couple of children could fit in that space at a time and they were very selective in whom they allowed in. (Image 4.25)

Next to this log was a puddle of water. The children at first walked around, afraid to get wet. Then one child with boots on, trudged through the water. After that, the rest
of the children were splashing and running through the water. (Image 4.26) Some children stayed out of the water because they did not have proper boots. The children did not immerse themselves in the water. However, when they got to the bus, water poured out of their boots.

**Visit 3**

The third visit was in March, during a time when there was uncharacteristically warm weather in Muncie. The children were in coats and boots because it had been wet. The children were very excited to be there on this visit. The woods had become familiar to them. During the two hours that they visited, several of the preschoolers indicated that this was their favorite place to be.

The children were asked to look for hiding places and shapes within the woods. Some participated in the exercise, but most were distracted and more interested in playing.

This visit, the children found an entirely new classroom. The space was marked by fallen logs on three sides; the other side had trees that acted as an open wall. The children stayed in this defined space without really realizing why they were contained in that area.

In this new classroom there was a hiding spot within a tree stump. (Image 4.27) The children were at first scared of going in, but again, as soon as one of their classmates went in, they all had to try. (Image 4.28) The same thing occurred when an
arch made from a fallen log was discovered. The peak of the arch was at least eight feet tall. As soon as one of the preschoolers climbed to the top, several others had to try. (Image 4.29) The children also noticed that a log was lying on another log and they realized that it could be a teeter-totter. (Image 4.30)

At the same time, some of the other children had gone exploring. They found an enormous puddle of water. This puddle was exactly where the waldsofa classroom is. The house that they had built with the branches during the first visit was still intact. The children, and a few of the teachers, did not recognize the space as one of the original classrooms.

Unlike the previous visit, the children were up to their waists in the water, and some fell in. Others were splashing each other. By the end, most of the children were soaking wet. This became a bit of a problem when they got back to their indoor classroom. They all had to be changed into dry clothes. Some of the children did not have spare clothes at Apple Tree. (Image 4.31-4.33)

Post Woods Interviews

After the second visit into the woods, the children were visited in their indoor classroom. They were asked what they liked about their visits to the woods and what they did not like. The majority of responses were that they liked the water and climbing.

During the second visit, there was one child who cried the entire time. Initially when he got to the woods, he became entangled in a thorny branch and got scared. He
did not like being there from that point on. He was the only one at the post visit interview who said he did not like the woods.

He came along on the third visit and was very timid. He slowly became more comfortable, but was on the first bus back to the indoor classroom. He was asked what he liked the most about the third visit. His response was that he did not cry.

**Behavior Conclusions**

The collected observational behavior data was important in understanding the children’s interaction with the outdoor environment. The behavioral observations and mapping of the children showed how the seventeen 3 to 5-year olds recognized space in the indoors and outdoors, and how their unfamiliarity and comfort level with their surrounding environment affected their learning.

By constantly being in groups of two to three, the children did not know how to interact in larger groups or be by themselves. The observational data showed that children need a variety of spatial settings that seasonally change. The variety of settings allows children to be engaged as individuals as well as in small and large groups.

Taking children to the woods and other native landscapes allows and gives children opportunities to behave in ways that they are not allowed to in regulated settings including playgrounds and classrooms.
Wild Kindergarten Studio

The Wild Kindergarten Design Studio was a research and evidence based design studio at Ball State University in the fall of 2011. The undergraduate students involved in the studio explored the rationale for the wild kindergarten movement while they learned how to design user-based outdoor learning environments. They also integrated phenomenological, case study and behavior mapping methods in the context of their individual and team landscape design processes. Implementation and advocacy strategies were examined and included restoration and reforestation methods, policy development, and funding.

The undergraduate students participated in the initial gathering of data including an archetypal study, the “Name Your Place” game, environmental analysis, and observational behavior mapping. By participating in the initial data collection, the undergraduate students had a better understanding of the underlying contextual attitudes of the children, parents and staff members of Apple Tree.

Challenges found by Wild Kindergarten Studio

Although the design studio was an 18-week course, the undergraduate students discovered some of the reasons why outdoor learning environments, especially forest kindergartens, are hard to implement in North America.
The first challenge discovered with implementation is the name “wild kindergarten.” In Germany, the word is “wald;” meaning “forest.” When discussing wild kindergartens, many people assume that kindergarteners are being let loose in the woods; that is not the case. The word “wild” refers to the setting, not the children. It was determined that “forest kindergarten,” although limiting the scope of the landscapes that can be used, provides a better initial image.

Because “wild” has different connotations, the meaning of wild and wilderness was discussed in the studio. Wild or wilderness can be thought of as a place, quality or idea. Wilderness as a place means that humans and nature are separated from each other. The quality of wilderness was discussed as an aspect of a landscape; for instance: a vista, a forest, a secluded area or a place that can be conquered. The idea of wilderness was discussed as the easiest to implement in a design. When people seek the idea of wilderness, they want to find peace and isolation in a place, and discover a sense of adventure. (Salmins)

Another challenge when implementing wild kindergartens in North America is the legislative restrictions and standards that are required in order to establish licensed childcare centers. Some of these restrictions are: children are not allowed to be in weather below 25 degrees with windchill; naps are to be on elevated cots, not on the ground; standing water is not allowed in play areas; mandatory access to toilets and hand-washing stations; the need for fall zone material and children must be visible to their teachers at all times. (IFSSA)
The meeting of curriculum standards is a concern among parents and educators. Research conducted in Europe shows that children who participate in wild kindergartens test higher, have better cognitive and motor skills, have better social skills, and are happier and healthier when compared to their indoor counterparts. The same standards that are achieved in indoor daycare facilities are achieved in forest kindergartens. (Robertson)

_Wild Kindergarten Studio Concepts_

After they collected research and observed the preschool children at Cooper, the nine undergraduate students produced individual design concepts for the site at Apple Tree. These concepts varied in plant density, canopy coverage and other important elements within the site. The undergraduate students used the observational behavior data and environmental analysis they collected to complete their designs.

After the nine concepts were presented, the students were divided into two teams and produced two final design concepts. One concept mimicked the Cooper Woodland. This concept was based on the indoor classroom observations. (Image 4.34) Several data sets were taken and overlapped to form a conceptual shape that could be directly used to provide the locations for the classrooms at the Apple Tree site. (Image 4.35)

The other concept incorporated a prairie into the design. The prairie is a familiar landscape ecosystem in the Mid-West. Within the site, the prairie would transition into
woodland much like the edge conditions at Cooper Woodland. This concept also provides diversity to the ecology of the site where just a woodland setting does not.

(Image 4.36)

Along with the two final concepts, the undergraduate students gave the director of Apple Tree a budget, a plant list, a grading plan and a timeline for design implementation in anticipation of Apple Tree collecting funding for the project. (Image 4.37 – 4.38)

Their designs and an aerial of Cooper Woodland were taken and transformed into a figure-ground study based on the canopy coverage. The black represents the tree canopy, while the white represents ground level vegetation. Within the designs, the tree canopy coverage varied from 45% to 85% coverage. This study determined that 100% canopy coverage does not define a forest classroom. (Image 4.39)
Design Narrative

Forest Kindergarten vs. Outdoor Learning Environment

As the research was being conducted and the data was being collected, the realization came forth that a setting for a forest kindergarten cannot be designed. A traditional forest kindergarten takes place in a forest setting, typically in a protected area that has had little man-made disruption. The setting is left alone, the branches and trees that fall are undisturbed, the plants and animals there are left to live without disruption. The pattern of the plants is natural and self selective and the “classrooms” are discovered rather than made. In an off-site location, forest patterns can be mimicked, but even then, the site will not be a naturally occurring old-growth forest.

Design Principles for Cooper Woodland and the Apple Tree Backyard

In order to discover the existing classrooms in Cooper Woodland and design them for the Apple Tree Backyard several design principles of forest kindergartens must be understood.
Children’s Scale

The first principle is children’s scale. Too many times, adults forget that children are smaller and literally see and experience things differently. Children have their own spatial needs and comfort level. For example, what an adult considers to be a low hanging branch is probably the correct height for a child; a hollowed log that is too small for an adult to crawl through is a comfortable tunnel for a child (Thwaites). When a space is designed for a specific client, it makes them feel comfortable and at ease in their environment. The behavioral observations and mapping conducted during the research gave an understanding of the spaces and the scale that the children felt the most comfortable in.

For the children to have a sense of wilderness in the Backyard as they do in Cooper, the scale of the Backyard has to provide the children with different experiences and opportunities. This will be difficult to achieve because of the urban setting that surrounds Apple Tree. Plant choice and how the plants are organized will have the ability to conceal the urban setting and provide the necessary openness and enclosure for the children; thus beginning to establish a sense of wilderness (Nabhan).

To mimic Cooper Woodland, some of the vegetative species and arrangement that are present there will be introduced to the Backyard. Spaces that exist between elements can be duplicated by bringing in elements found in the woodland. Some of
these might include fallen logs, hollowed stumps, boulders and rocks, and a variance in ground cover.

**Self-directed Curriculum**

Another design principle is the self-directed, opportunistic curriculum that is the basis for successful forest kindergartens. The observational data showed that during the visits to Cooper Woodland, the adults had a difficult time letting the children experience and discover on the children’s terms. When the curriculum becomes opportunistic the children are able to find and discover places and events on their own and then ask the teacher for additional guidance and knowledge. Their learning becomes empowering as they are able to control the lessons they learn throughout the school day.

**All Weather, All Day**

All day, all weather, and all season learning is a third design principle. The children need to see, feel, and experience weather and seasonal changes so that they can understand nature and themselves. As found in the adult survey, the adults stated that weather conditions did not affect their children being outdoors (see chapters 3 and 4). Their concern was the availability of proper clothing. By keeping children indoors because of the lack of proper clothing and by teaching them through computers and text books, the children miss out on the actual experiences that seasonal and weather conditions create.
The classrooms discovered at Cooper changed before the children’s and adults’ eyes with each visit to the woodlands. This occurred because of vegetative seasonal changes as well as the new found familiarity to the site the visitors felt.

Like Cooper, the Backyard can provide seasonal interest through plant choices. Pathways and natural materials can be used and manipulated by the children in both places. The classrooms in both locations change seasonally and as a result, will be used differently because of the environmental changes.

As the plants begin to grow, the Backyard will transform into a place that can be used in all seasons. The canopy of the trees will provide safe places in inclement weather and the shrubs and bushes will provide hiding places. The rehabilitation of the site will provide progressive interest over the years as it matures for all who have access to it.

**Stewardship of the Land**

The final design principle is that of stewardship of the land. By experiencing a natural setting on a daily basis, the children and faculty will become aware of their responsibilities to respect their surrounding environment. The children will learn how they can interact with the natural surroundings while still being respectful of the plants and animals that live there.

As the Backyard is being rehabilitated, the children will have the opportunity to create a landscape that they can be proud of and responsible for. By using and
mimicking the natural processes found in Cooper, including correct soil mixes, random plant distributions, etc., the children will become part of the evolution of the Backyard and will see and experience the change and diversity of landscape types.

Like the various ecosystems found in Cooper, the diversity of the Backyard will rely on the appropriate soil mixes for each of the desired ecosystems. For example, a wetland requires a heavier clay-based soil, while a woodland soil mix has a deeper layer of leaf litter. The soil mix for a prairie is deep and accommodates the long roots that accompany prairie plants.

**Design Program for Cooper Woodland**

Because an old growth forest cannot be replicated, it is imperative that the children continue to be transported to Cooper Woodland or similar deep woods locations in order to gain an immersive woodland experience. In order to keep the integrity of a traditional forest kindergarten and so that the children at Apple Tree have the opportunity to experience a forest kindergarten, trips to Cooper Woodland will continue. This will also contribute to the growing body of knowledge regarding forest kindergartens.

Permission from the Ball State University Field Station board was granted to continue the forest kindergarten program as part of an on-going research project with faculty in the Department of Landscape Architecture.
Cooper Woodland Classroom Map

Because of the decision to continue the forest kindergarten research at Cooper Woodland, a conceptual design based on initial findings from the Wild Kindergarten Studio and subsequent visits to Cooper with the children was developed. The classroom map locates the five discovered classrooms according to their location within the woodland. (Image 5.1) After the trips to Cooper, the rooms were measured dimensionally to understand how they could be translated to the Backyard at Apple Tree.

Due to the size of the Backyard in relation to Cooper, the classrooms at Cooper cannot be directly replicated; there is not enough room at Apple Tree. The compression and expansion of the view shed that exists by virtue of deciduous foliage change at Cooper cannot be fully accomplished in the Backyard. Scaled down classrooms in plan and section will be transferred to the design for the Backyard classrooms, but the rooms will be more static and the children’s movement will be more restricted than in the woodland setting.

The five classroom settings in Cooper that were used for the initial behavioral research are available for future research. At this time, no further design exploration was conducted.
Apple Tree Backyard

The Apple Tree Backyard will not be a traditional European forest kindergarten at maturity. However, it can be programmed to operate as a forest kindergarten in an outdoor learning environment based on the habits and characteristics of Cooper Woodland. This design decision fits with the wants and needs of Apple Tree YMCA and will allow the children at Apple Tree to gain and experience nature at many different levels of wilderness while still maintaining their access to deep woods locations like Cooper Woodland.

The administrators of Apple Tree have certain needs related to the curricula, the number of children at the childcare center and their own physical and operational capacity. The administration wants to give access to the Backyard to as many of their children as possible and expose them to a diversity of landscapes.

Because the children and faculty at Apple Tree are the clients, understanding how the preschoolers at Apple Tree used the indoor and outdoor space individually and in groups provided data that was necessary to design a successful outdoor learning environment that involves “best practice” design strategies in this context.

Concept

Based on the site analysis, behavioral data and client preferences, the concept for the Apple Tree YMCA Child Development Center’s site focuses on the idea of “the
A backyard is available to most children and they are familiar with its context. In the “favorite place” portion of the adult surveys, 30% indicated that the backyard was their child’s favorite place to be outside.

The physical organization of space is concentric. This provides interest in the center of the site and draws the user into the middle. (Image 5.2) Also, the dense outer edges provide the necessary screening and privacy for the site.

**Design Program for Apple Tree Backyard**

Based on the principles of the forest kindergarten derived from the research, the design program consists of two design components that are critical for the success of the Apple Tree Backyard design. These components are: a transitional zone between the indoor and outdoor classrooms and four distinct outdoor classrooms that are arranged concentrically along winding paths that get progressively wilder. (Image 5.3)

*Transition Zone*

While taking the children to the woods, it became evident that a space for cleaning up after going to the woods was necessary. In a true wild kindergarten setting, the children do not go in and out of a building during the day. However, in the Backyard, the children will be coming in from outside play and through the indoor facility. Their wet clothes will need a place to be hung up and laundered; their boots will need to be washed and stored.
Because of this observation, the program incorporates a recommendation that another entrance be created into the building. This entrance will be used by the children going to the forest kindergarten at Cooper as well as the children who use the Backyard. A vehicular drop-off was added to accommodate the anticipated increase in traffic flow.

(Image 5.4)

This transition area will have a mini-locker/storage area and laundry facility so that the children who come from Cooper and the Backyard will have a place to wash and store their boots and clothing. A pool deck surface will be installed where the children can hose off their shoes, and probably themselves, after their trips to the Backyard and to Cooper.

Currently, this space has a traditional playground structure. This structure will remain but will be hidden from view when the children are in the Backyard. It is imperative that the children who use the Backyard do not see the built environment; otherwise, they will not experience the same full immersion into a natural setting as they do in Cooper.

Transition is a key component in the design program of the Backyard. The children and teachers need to feel at ease when they enter the outdoor learning environment otherwise they will not feel comfortable using the space. The transitional zone begins the user’s transition from built to more natural as well as their overall transition from man-made to wilderness.
Four Distinct Classrooms

Having four distinct classrooms within the Backyard was based on the clients’ needs and the administrations’ wants. This is necessary because of their intended use of the outdoor learning environment coupled with licensing restrictions. Not only are there restrictions on the number of students per teacher, there are also restrictions that define age group interactions and classroom mingling.

The separation of the classrooms will be accomplished by visual and physical separation. Unfortunately, a child from one class will be able to hear other children who are using a different part of the Backyard. It is anticipated that this will be a limitation to the Backyard and will deny the children the experience of immersion in nature. If Apple Tree wants multiple classes to use the Backyard at the same time, coordination among the teachers will be crucial to its success.

Using the collected environmental analysis as a landscape palette, the topography and orientation of the site yields many possible landscape ecosystems. The classrooms for the Backyard include a garden classroom; a prairie classroom; a woodland classroom; and a wetland classroom. (Image 5.5-5.6)

These classrooms will provide a multitude of learning opportunities for all those involved and will enable the teacher to plan specific lessons for that specific classroom setting. The individual design for each of the four classrooms will be based on
suggestions found in the literature and from the observational data that was collected during the research process.

**Garden Classroom**

From the transitional area, the teachers and children enter the garden. Their gardens will include vegetables and flowers that the children and teachers will grow. There will be a composting station, a tool shed and the existing greenhouse will be used for propagation. The vegetables grown will be used in the school’s lunches.

**Prairie Classroom**

The vegetable and flower beds within the garden classroom will transition into a butterfly garden and into a prairie. This transition allows the users to feel comfortable in the transition from the built to the more natural environment. The butterfly garden and prairie are familiar landscapes to the children and adults because of its regional context.

**Woodland Classroom**

The prairie will be separated from the woodland classroom by a buffer of dense shrubs and small trees. This separation will mimic the plants at Cooper Woodland. Within the woodland, there will be a waldsofa close to the center. This will act as a central gathering location for children and adults who use the Backyard. Within the woodland classroom will be fallen logs and other elements that are familiar to the children because of their multiple visits to Cooper Woodland.
Based on the observational data, the fallen logs and similar natural elements will become a critical part of the Backyard design. They will give the children opportunities to improve their motor skills, their social interactions and their imaginative play. Also, the elements will help define the classrooms at their eye level.

**Wetland Classroom**

The northeast corner of the Backyard has plants that are indigenous to a wetter soil condition. This portion of the site will become a wetland classroom so that the children can learn about that type of ecosystem. Different ecosystems within an outdoor learning environment provide variety for the children who are there. The flowing water provides a kinetic experience as an alternative to the static nature that children are used to experiencing in traditional playground spaces.

Currently, the drainage system on the roof at Apple Tree causes flooding outside the building. The flooding is a problem because standing water is not allowed on a playground. To alleviate the flooding, drains were installed outside the classroom doors so that the water would drain into the city water lines instead of into the building. During large rain events, the playgrounds around the building still flood.

To potentially solve this flooding problem, stormwater can be captured from the roof and transported off-site through a water feature in the Backyard. The water feature can become part of the transitional area between the indoor classrooms as well as in
the outdoor learning center. Not only can this element be used as an educational opportunity, it will also be used to allow a wetland to develop on site.

The stormwater from the roof to the Backyard will be brought sculpturally into the Backyard and will then transition into a channel designed as an “ephemeral stream” that will provide seasonal water play opportunities. At times it will be a dry stream bed because of precipitation patterns.

The stream will wander through the wetland as well as the woodland classroom over a course of about 250 feet. The stormwater will be directed through the wetland and then channeled into the storm ditch at the northwest corner of the site. Questions raised by the client of detention and reuse of the stormwater will be addressed with the detailing and shaping of the full extent of the wetland planting area based on soil reports.

**Sustainable Design Implementation Strategy**

Based on the findings from the Wild Kindergarten Studio, a sustainable implementation strategy was developed for the Backyard. The design will be implemented in three phases that will occur over an eight year time span. (Image 5.7)

*Phase 1*

The first phase concentrates on preparing the Backyard for rehabilitation. The invasive species and noxious weeds will be removed from the site through sustainable
techniques that include blankets, mulch and selective clearing. Topographical changes to the site will occur so that once the plants are installed the earth will not be disturbed. The preparation of the proper soil mixes that will encourage the development of the different ecosystems will also happen.

This phase will include the installation of the “mud room.” At minimum, the mud room will include decking and a hose bib that will allow the children to wash before they enter their indoor classroom. The entryway and gate will also be installed during phase one.

Phase 2

Phase two of the design implementation will be the installation of the nurse crop. This will include 1500 to 3000 bare root seedlings that the children will be able to plant. As the initial planting grows, other plantings will be installed. The waldsofa will be installed and other malleable elements that are characteristic of woodland settings will be added.

Phase 3

The third and final phase will be the installation of the stormwater stream and the prairie. The stormwater stream will alleviate the flooding of the Apple Tree building by creating a wetland within the Backyard. The prairie classroom will be installed last, but will be the first of the classrooms to resemble the landscape it is mimicking. (Image 5.8)
The eight year time frame for the installation of the design does not account for the continued maintenance and upkeep that will be required for the Backyard to fully recover from its current fallow condition. Once the design is implemented and installed, the Backyard will require continued maintenance to ensure its appropriateness for an outdoor learning environment.

**Analysis of Design Programs for Cooper Woodland and the Backyard**

By conducting a strength, weakness, opportunity and threat (SWOT) analysis for the design programs of both sites, the potential for each site can be understood and the parameters for the next steps in the research can be defined.

**Cooper Woodland Program**

**Strengths**

Cooper Woodland is located one mile from Apple Tree. It is rare that an old growth forest is located in such close proximity to a childcare facility. Because of Apple Tree’s ownership of activity buses, they are able to transport children easily to and from Cooper Woodland.

Another strength to the site is that Cooper Woodland is a research facility and is owned by Ball State University. Because Apple Tree is working with the Landscape Architecture Department at Ball State to conduct research, permission was given to use the property for research.
Weaknesses

A weakness to the site is the fact that it is a research facility. Multiple university research projects are being conducted in the site. Coordination becomes crucial among the researchers and the teachers at Apple Tree so that the children do not disturb the ongoing research projects.

Also, the impact that 200 children can have and will have on an old growth forest is detrimental to the integrity of the woodlands at Cooper. The children who will have access to the site will be limited in number in order to prevent the deterioration of the site that little children can cause.

Opportunities

The opportunity that children have to experience, play and learn in an old growth forest is invaluable. Most people, let alone 3 to 5 year old children, have not had that experience.

Another opportunity is the possible research outcomes. By having children who are exposed to a traditional forest kindergarten, an outdoor learning environment, and an indoor childcare, longitudinal research and studies can be conducted to understand the benefits of outdoor learning on young children.
Threats

The biggest threat is the loss of Cooper Woodland for research. If it is determined that the children are disturbing the ongoing research, or are harming the environment of the old growth forest, the permission for access will be taken away. If Cooper is taken away, another deep woods location will have to be found.

Apple Tree Backyard Program

Strengths

The overwhelming strength to the Backyard at Apple Tree is just that – it’s their backyard. The location of the outdoor learning environment is ideal for any childcare who desires to have outdoor classrooms. The children enrolled at Apple Tree, as well as other childcare centers in the area, can have access, on a daily basis, to an outdoor learning environment that is designed according to their wants, needs and functions.

Weakness

Because of the want of the client to have multiple indoor classes use the Backyard simultaneously, distinct classroom spaces had to be designed in the space. Based on the principles of forest kindergartens, this want becomes a major weakness in the design of the space.
The size of the Backyard is too small to accommodate large numbers of children if the goal of the Backyard is for the children to feel immersed in nature. The children will hear other children that they, because of legislative restrictions, are not allowed to interact with. The teachers will be forced to corral their students so that the others using the site are not disturbed. This one weakness limits the value of children being in an opportunistic learning environment because they will be forced to follow adult imposed rules.

**Opportunities**

By having access to an outdoor learning environment the children will have the opportunity to be in and learn from a natural setting every day. They will have the opportunity to witness seasonal changes in the site, observe the growth of plants, watch various animals establish habitats in the Backyard and learn from a landscape that changes along with them.

**Threats**

The overwhelming threat to the Backyard is failure in implementation. Based on the concepts developed in the Wild Kindergarten studio, a budget of $100,000 was estimated for installation. This budget does not include the long term maintenance that is required to ensure the success of the reforestation strategy that will be used.
The site hinges on the success of the sustainable rehabilitation methods that will change the site from a vacant lot full of invasive species to an outdoor learning center where children can be comfortable with and learn from nature on a daily basis. If the site fails, then the children will not receive the desired lasting effects that nature has.

**Post-Occupancy Evaluation of Implementing Design Program**

All of the design conclusions are rooted in the collected data of the sites and through vicarious sources. Apple Tree YMCA Child Development Center has a unique opportunity to have an outdoor learning environment adjacent to their indoor facility as well as maintaining access to a traditional wild kindergarten setting as part of their preschool curriculum.

This design opportunity afforded by this project provides an opportunity to study classroom design and the effect of an outdoor learning environment on the children’s cognitive and behavioral development. A post-occupancy evaluation is a way to determine whether an evidenced-based design hypothesis is working. Questions used in the post-occupancy evaluation might include:

1. When compared to their indoor classroom, do the children behave better in the Backyard?
2. Comparing the two environments, do the children self-direct more indoors or in the Backyard?
3. How are the children’s spatial preferences in the indoor classroom different and similar when compared with the Backyard?
Conclusion

Research Question: By defining the barriers and opportunities for outdoor learning at the preschool/kindergarten age level in Muncie, Indiana, what will be the best configuration and design strategy needed for a wild kindergarten?

The Apple Tree YMCA Child Development Center in Muncie, Indiana, wants the children who are enrolled in their daycare to be exposed to the outdoors. Because the YMCA owns the empty lot next to the daycare facility, they are willing to turn the 1.75 acre lot into an outdoor learning environment.

To maximize the possible benefits that the children will have by having access to an outdoor learning environment, a research study that included a literature and media review, indoor and outdoor behavioral observations, and adult and child preference surveys, was conducted. The study focused on an evidence-based design approach based on the understanding of the ecology of the site and region, the capacity of Apple
Tree to manage and utilize an outdoor learning environment, and the attitudes of the children, parents and faculty of Apple Tree to the outdoors.

To do this, the study recorded observations based on the children’s behavior in their indoor classroom, their playground and in Cooper Woodland. Through survey instruments, the study gathered opinions and preferences about the parent’s attitudes towards the outdoors and the staff’s willingness to teach outdoors. The study also included detailed site and regional ecological studies.

A literature and case study review identified best practices and prevailing prejudices related to outdoor learning. All of the data collected from the reviews and investigations resulted in a framework, based on the children’s behavior in their environments that was used to develop a design program for the Apple Tree Backyard.

The findings concluded that the forest kindergarten program be held at Cooper Woodland and that a smaller outdoor learning environment should be designed and implemented for everyday use at the Apple Tree YMCA Child Development Center. This dualistic solution supplies many of the aspects of a forest kindergarten in a close-by landscaped facility. Because of this conclusion permission was granted by the Ball State Field Station to continue the use of Cooper Woodland for research in forest kindergartens.

The restricted use of Cooper Woodland indicates the need to identify native landscapes in the region, and eventually across the United States, that are near or
accessible to childcare settings. The biggest barrier in the development of forest kindergarten programs is access to forests and wild areas. Near-by wilderness will be necessary for children across the United States to have equitable access to “wild” settings for outdoor learning.

In order to implement the outdoor learning environment at Apple Tree, funding needs to be acquired. Local foundations, as well as national grants will be looked into to acquire funds for the project. This project has the opportunity and ability to encourage a transformation in outdoor learning environments especially those designed for preschool-aged children.

The knowledge needed for the proper design of wild kindergartens and outdoor learning environments needs to be understood and developed by landscape architects. Classroom teachers will need to adapt their teaching styles to optimize the opportunities afforded by the outdoor classroom. Continued post-occupancy research in the design outcomes from the Forest Kindergarten at Cooper Woodland and the Apple Tree Backyard will contribute to the growing awareness of the impact of outdoor learning environments on children’s life skills and environmental values.

The prototype and method developed from the research used to design Apple Tree’s Backyard and Forest Kindergarten at Cooper Woodland can be used as a basis to develop design standards for outdoor classrooms for preschool-aged learning in multiple ecologies such as prairies, deserts, wetlands, etc., across the United States.
Works Cited

Introduction


Ch.2.1 - Children Need Nature


Green, Christopher E. “Think Outside the Building.” *American School and University*. May 1, 2010.


Mills, Andrea. “Early-Childhood Education Takes to the Outdoors.”


Works Cited


Ch2.2 - Factors Preventing


http://www.neefusa.org/health/children_nature.htm


McKie, Stewart. The Role of Landscape in Film. September 3, 2009.
http://internetvideo.sys-con.com/node/1087361/print


Ch 2. 3 - Learning Outside


Burdette, Hilary L. and Robert Whitaker. Resurrecting Free Play in Young Children. 
Looking Beyond Fitness and Fatness to Attention, Affiliation, and Affect. Arch 


in Early Childhood, Volume 5, Number 1, 2004.


Ducharme, Roberta. An Interview with Helle Heckmann at Nokken in Copenhagen. 
Viroqua Wisconsin. 1999.

Dyment, J.E. and A.C. Bell. Grounds for movement: green school grounds as sites for 
952-962.

Fjúrtoft, Ingunn. The Natural Environment as a Playground for Children: The Impact of 
Outdoor Play Activities in Pre-Primary School Children. Early Childhood 

Fjúrtoft, Ingunn and Jostein Sageie. “The Natural Environment as a Playground for 
Children: Landscape description and analyses of a natural playscape.” Landscape 

Ginsburg, Kenneth R. The Importance of Play in Promoting Healthy Child Development 
Volume 119, Number 1, January 2007


Mills, Andrea. Early-Childhood Education Takes to the Outdoors.


Ch. 2.4 - Forest Kindergartens


Butterfly Garden. http://s323449960.initial-website.com/about-this-school/

Carbondale Wald Kinder. www.carbondalewaldkinderpreschool.blogspot.com

Carp Ridge Forest Preschool. www.carpridgeforestpreschool.blogspot.com

Cedarsong Nature School. www.cedarsongnatureschool.org


Earth Roots Field School. www.earthrootsfieldschool.org

   http://www.explore-mag.com/article/people/kids-gone-wild/

Gypsumgirl. Waldkindergartens: Outdoor or Forest Preschools.


Kahn, Peter H. Jr and Stephen R Kellert, ed. Children and Nature Psychological,
   Print 2002.

   Print. 2009.


Mills, Andrea. Early-Childhood Education Takes to the Outdoors.


Mother Earth School. www.motherearthschool.com


http://www.edsup.co.uk/ArticleView.aspx?pid=344


Ch. 3 Data Collection


Ch. 4 Findings


Ch. 5. Design Narrative
