

A TEACHABLE MOMENT: DISCOVERING THE POTENTIAL OF SOUTHERN HIGHLANDS
RESERVE TO CONNECT CHILDREN AND NATURE.

by

KELLY MICHELLE HOLDBROOKS

(Under the Direction of Alfie Vick)

ABSTRACT

Connecting children to nature through play, and fostering their relationship with nature is critical for development. This thesis explores the human relationship with nature, the history and significance of play, and the meaning of landscape, which identifies and defines the characteristics, benefits, and tangible & intangible elements for the nature play network. The nature play network is evaluated by constructing a matrix to compare patterns, and by applying the design framework to the Southern Highlands Reserve, located in the southern Appalachian Mountains of North Carolina.

INDEX WORDS: Nature play, Nature connection, Culture, Play, Landscape
meaning, Cherokee, Biophilia, Children, Education, Environment

A TEACHABLE MOMENT: DISCOVERING THE POTENTIAL OF SOUTHERN HIGHLANDS
RESERVE TO CONNECT CHILDREN AND NATURE.

by

KELLY MICHELLE HOLDBROOKS

B.A., Rhodes College, 1997

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial
Fulfillment of the Requirements for the Degree

MASTER OF LANDSCAPE ARCHITECTURE

ATHENS, GEORGIA

2012

© 2012

KELLY MOCHELLE HOLDBROOKS

All Rights Reserved

A TEACHABLE MOMENT: DISCOVERING THE POTENTIAL OF SOUTHERN HIGHLANDS
RESERVE TO CONNECT CHILDREN AND NATURE

by

KELLY MICHELLE HOLDBROOKS

Major Professor:	Alfie Vick
Committee:	Marianne Cramer
	Elizabeth Hargrove
	Umit Yilmaz

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
May 2012

DEDICATION

To the Circle of Fire; those who have gone before, those who are present, and those who have yet to come.

ACKNOWLEDGEMENTS

I would like to humbly acknowledge my major professor, Alfie Vick for guiding me throughout my graduate education. His willingness to embark on this journey and collaborate with me on my thesis work was invaluable. I would also like to thank Robert & Betty Balentine, and the staff of Southern Highlands Reserve for their support with my research.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	V
LIST OF FIGURES	Viii
CHAPTER	
1 Introduction	1
Purpose & Intent	1
Organization	2
2 Humans Relationship with Nature.....	3
3 History and Significance of Play.....	15
Nature Play	25
Benefits of Nature Play	26
4 Finding Meaning in Landscape	35
5 Design Framework.....	46
How To Use the Matrix.....	48
Tangible Elements	51
Intangible Elements	55
6 Design Framework Applied to Southern Highlands Reserve	59
Site History	59
Inventory	63

7 Conclusion	83
REFERENCES	86
APPENDICES	
A Nature Play Network Matrices	88
B Nature Play Network Diagrams Inventory	99
C Southern Highlands Reserve: Site Maps	108

LIST OF FIGURES

	Page
Figure 5.1: Venn Diagram: Nature Play Network	47
Figure 5.2: Nature Play Network Matrix Example	50
Figure 6.1: Site Map: 300 scale.....	64
Figure 6.2: Site Map: 100 scale.....	65
Figure 6.3: Woodland Glade.....	64
Figure 6.4: Woodland Glade.....	65
Figure 6.5: Azalea Walk	66
Figure 6.6: Azalea Walk	67
Figure 6.7: Wildflower Labyrinth	68
Figure 6.8: Wildflower Labyrinth	69
Figure 6.9: Mossy Bench Area Entrance	69
Figure 6.10: Mossy Bench Area	70
Figure 6.11: Chestnut Lodge.....	72
Figure 6.12: Steps from Chestnut Lodge to Roof Garden.....	72
Figure 6.13: Roof Garden	73
Figure 6.14: Soapstone Sculpture on Roof Garden	73
Figure 6.15: Vaseyi Pond	75
Figure 6.16: Vaseyi Pond	75

Figure 6.17: View Site & Vaseyi Pond	77
Figure 6.18: View Site	77
Figure 6.19: Vaseyi Trail & Bridge	78
Figure 6.20: Yellowwood Trail	79
Figure 6.21: Winterberry Trail	80
Figure 6.22: Hike to the Spray Cliffs	81
Figure 6.23: Via Ferrata	82

CHAPTER 1

Introduction

Purpose & Intent

There is a critical issue facing our children, and therefore, our world. There is a growing gap between children and nature. The past few decades have seen an enormous decline in children playing outside. According to a study done by Sandra Hofferth at the University of Maryland between 1997 and 2003, there was a decline of fifty percent in children age nine to twelve who spent time participating in outside activities such as walking, hiking, gardening, fishing, and beach play. A study conducted by Rhonda L. Clements at Manhattanville College found that seventy-one percent of today's mothers played outside everyday, whereas only twenty-six percent of them reported their children playing outside daily (Louv 2005,34). Many factors are involved in this rapid evolution of our culture. The greatest contributors to this problem are as follows: (1) lack of green space available to children, (2) decrease of physical activity, (3) increase in time spent with technology, screens to be specific, (4) parental and community fear, and (5) free time has been almost eradicated from our children's lives through structured activities. The purpose of this thesis is to address the growing decline in children's participation in nature play. How can a design framework improve a child's access to nature? Are there tangible and intangible elements that foster a child's connection to nature? How can these elements be constructed into a design framework that defines and evaluates the nature play network of a landscape?

The author has developed a design framework called the nature play network in order to evaluate a landscape's potential in providing opportunities for nature play. The nature play network seeks to enhance the overall opportunities within a landscape for nature play. Specific elements for nature play have been defined in order to inventory the existing conditions of a landscape. These elements are to be evaluated in each area and holistically in order to fully assess the network. The elements serve as hubs and links within the network.

Organization

Nature play is beneficial to childhood development cognitively, socially, physically, and culturally. Theories and research in multiple disciplines have added credence to the importance of preserving and creating opportunities for children to participate in nature play. In the following chapters, a structure for identifying the importance and connection of humans to nature and play is developed. Chapter Two explores the relationship of humans with nature through the lens of Edward O. Wilson's theory of biophilia. Chapter Three identifies the importance and significance of play throughout human history, and explains the benefits of nature play. Chapter Four analyzes the meaning of landscape for humans, and focuses on a specific geographic area, southern Appalachian Mountains for the purpose of applying the design framework. Chapters Five, Six, and Seven are the culmination of synthesizing theories and research, developing design framework in the form of a matrix for the nature play network, and applying them to a specific site; Southern Highlands Reserve.

CHAPTER 2

Humans Relationship With Nature

Edward O. Wilson is credited with the coining of the term biophilia. His research and book providing a hypothesis, and thus foundation, for many scholars in a variety of disciplines to further explore the relationship of humans to nature. His work in defining biophilia is considered seminal and provocative; therefore this chapter will explore his hypothesis in great detail. In Biophilia, Edward O. Wilson explores the human relationship with nature. His research chronicles his experience as a field biologist, and speaks to the interconnection of flora and fauna within any given ecosystem. Stephen Kellert co-edited The Biophilia Hypothesis with Wilson, and explains biophilia in his introduction as, “In 1984, Edward O. Wilson published an extraordinary book, *Biophilia*, which sought to provide some understanding of how the human tendency to relate with life and natural process might be the expression of a biological need, one that is integral to the human species’ developmental process and essential in physical and mental growth.” (Wilson 1984, 20) In his book, Wilson describes his twenty-year journey of research and reflection in a single term, biophilia, which he simply defines as, “the innate tendency to focus on life and lifelike processes” (Wilson 1984, 1). He proposes this hypothesis through the prose of his experiences as a field biologist, and lays claim to the following, “to explore and affiliate with life is a deep and complicated process in mental development” (Wilson 1984, 1).

Stephen R. Kellert, scholar and professor emeritus at Yale University School of Forestry and Environmental Studies, acknowledges the depths of Wilson's Biophilia by stating that it surpasses societal norms of viewing nature through poetry and philosophy. Wilson proposes that a human need, found in evolutionary development, exists to explore the intimate relationship with the natural environment. In Wilson's terms, we should "to look to the very roots of motivation and understand why, in what circumstances and on which occasions, we cherish and protect life" (Wilson 1984, 138-139). Kellert further explains Wilson's biophilia hypothesis through the following summary, "that the human inclination to affiliate with life and lifelike processes is: inherent (that is, biologically based), part of our species' evolutionary heritage, associated with human competitive advantage and genetic fitness, likely to increase the possibility for individual meaning and personal fulfillment, and the self-interested basis for a human ethic of care and conservation of nature, most especially the diversity of life" (Wilson 1993, 21).

Wilson expands on the biophilia hypothesis through explaining our genetic bio cultural evolution. He states that biophilia is a set of complex behavior patterns that have evolved through human history. Biophilia is in essence an innate instinct, and is comprised of a series of learning rules. Evolution is connected to these learning rules in that feelings and therefore response are created from experiences in a natural environment. These feelings and responses range from attraction to aversion, from peacefulness to fear-driven anxiety, and from awe to indifference (Wilson 1993, 31).

Wilson proposes that if no evidence for biophilia existed at all, the hypothesis is supported by evolutionary logic. The history of humans began tow million years ago with the origin of the

genus Homo. Eight to ten thousand years ago there is a shift in human history due to agriculture. Therefore, human history is represented as people living as hunter/gatherers for over ninety-nine percent of their existence on Earth. During this evolution, humans developed with other organisms and were interconnected with their natural environment for survival. They were dependent on knowledge through learned experiences with the natural environment. Wilson notes that this behavior can be seen in chimpanzees today through their use of primitive tools and overall knowledge of animals and plants (Wilson 1993, 32).

Wilson examines the evolution of biophilia. He states the following as an plausible explanation, “bio cultural evolution, during which culture was elaborated under the influence of hereditary learning propensities while the genes prescribing the propensities were spread by natural selection in a cultural context” (Wilson, 32). Wilson is stating that the evolution of biophilia is a direct result of gene-culture coevolution. He and Charles Lumsden hypothesized a specific genotype enables a behavioral response, and if the response increases survival and reproductive fitness then it will be passed on to future generations. As the genotype spreads, so will the behavioral response (Wilson 1993, 33).

Wilson takes the biophilia hypothesis a step further in that he claims humans have a strong tendency to work out their emotional feelings through stories and dreams. Through this assertion, he believes humans’ coevolution with the natural environment is expressed in religion, art, language, and culture (Wilson 1993, 33).

There is evidence that humans have been connecting to their natural environment through language and culture for tens of thousands of years. There are many myths, symbols, art, metaphors, and ceremonies centered on animals and plants in human history. Some examples are:

- Art found in the Lascaux caves of southwestern France, depicting animals, humans, and geometric symbols dating back to the Paleolithic period which is about 17,000 years ago
- Ancient Greeks created pottery, sculptures, architecture, and drawings representing humans, animals, mythical creatures, plants, and gods & goddesses
- Indigenous people of the Americas practiced ceremonial dances in honor of plants and animals.

For the purpose of testing the coevolution of genes and culture in his biophilia hypothesis, Wilson offers the example of the human relation to snakes. He develops the scenario from elements established by Balaji Mundkur, a biologist and art historian. The following points are an excerpt from Wilson's work:

- Poisonous snakes cause sickness and death in primates and other mammals throughout the world.
- Old World monkeys and apes generally combine a strong natural fear of snakes with fascination for these animals and the use of vocal communication, the latter including specialized sounds in a few species, all drawing attention of the group to the presence of snakes in the near vicinity. Thus alerted, the group follows the intruders until they leave.

- Human beings are genetically averse to snakes. They are quick to develop fear and even full-blown phobias with very little negative reinforcement. (Other phobic elements in the natural environment include dogs, spiders, closed spaces, running water, and heights. Few modern artifacts are as effective-even those most dangerous, such as guns, knives, automobiles, and electric wires.)
- In a manner true to their status as Old World primates, human beings too are fascinated by snakes. They pay admission to see captive specimens in zoos. They employ snakes profusely as metaphors and weave them into stories, myth, and religious symbolism. The serpent gods of cultures they have conceived all around the world are furthermore typically ambivalent. Often semi human in form, they are poised to inflict vengeful death but also to bestow knowledge and power.
- People in diverse cultures dream more about serpents than any other kind of animal, conjuring as they do so a rich medley of dread and magical power. When shamans and religious prophets report such images, they invest them with mystery and symbolic authority. In what seems to be a logical consequence, serpents are also prominent agents in mythology and religion in a majority of cultures (Wilson 1993, 33-34).

He concludes that humans repeated experience of exposure to snakes as a threat to survival in evolutionary time has coded a genotype through natural selection, and thus there is a hereditary aversion and fascination to snakes. Humans have also adapted their culture through myth, symbols, stories, songs, art, dreams, and religious beliefs (Wilson 1993, 34).

Stephen R. Kellert has researched human connection to nature for decades. He proposes that the human need for nature is not merely connected to the physical and material uses of

the environment, but also to the influence of nature on humans' cognitive, aesthetic, spiritual, and emotional development (Wilson 1993, 42). He believes the biophilia hypothesis suggests humans have evolved with nature through developing a value system for life and lifelike processes. In the Biophilia Hypothesis, he describes typologies for valuing human connection to nature. The typologies are a hypothesis for learning rules and a tangible means of assigning value to the biophilia tendency.

Kellert initially developed nine typologies in the 1970s to study the basic perceptions humans had on animals. He applied the typologies in numerous studies:

- Human perceptions of varying taxa including wolves, marine animals, endangered species, bears, and invertebrates
- Nature related perceptions of diverse human groups such as birders, hunters, farmers, and the general public distinguished by gender, age, place of residence, and socioeconomic status
- Cross-cultural perspectives of nature and animals in Japan, Germany, and Botswana
- Historical shifts in perception of animals in Western society (Wilson 1993, 44)

Through his typologies, Kellert assigns a classification system of value to humans' evolutionary dependence on nature for survival and self-fulfillment. These typologies are important to review in that they can be connected to basic childhood development stages. The typologies Kellert uses in order to better understand the biophilia tendency and hypothesis are as follows: utilitarian, naturalistic, ecologicistic-scientific, aesthetic, symbolic, humanistic, moralistic, dominionistic, and negativistic (Wilson 1993, 43).

Utilitarian

This typology refers directly to humans' value of the natural environment in relation to physical needs being met, specifically, shelter, food, protection, and security. By definition utilitarian could be applied to all of the typologies, however in this instance it is clearly focused on the natural environment as material value.

Naturalistic

In the simplest terms, this typology is the mental and physical fulfillment humans experience from contact with nature. The value is associated with the experience of wonder, fascination, and awe in a natural environment. It is directly connected to the desire for exploration in nature, and is considered of the most ancient motives for humans' relationship to nature. Humans evolved by gaining knowledge of the flora and fauna in their natural environment through curiosity and exploration. In modern day, mental and physical benefits are measured through outdoor activity in wilderness and urban nature. The scholars Ulrich, Kaplan, Driver, and Brown found that stress mitigation, relaxation, and enhanced creativity were the result of experiences in nature (Wilson 1993, 45-46).

Ecologistic-Scientific

There are differences between ecologistic and scientific, and yet the roots of both perspectives are found in humans' motivation to study the natural environment. Humans have a desire to study life and lifelike processes. Both also rely strongly on empirical data. Ecologistic is concerned with interconnection and interdependence of a natural environment. Whereas scientific is focused on one organism in a nature, and is viewed as reductionist. Although both are vested in systematic inquiry, the ecologistic typology was key to humans' survival simply through observation skills (Wilson 1993, 46-49).

Aesthetic

Natural beauty is powerful to humans. Throughout history, humans depict nature in literature, art, and stories. The spectrum of aesthetic is large, ranging from mountain views to plants in a vacant lot to wildlife. Regardless of the preference, aesthetic typology creates an emotional response in humans. Biological advantages are more difficult to define in the aesthetic typology. However, scholars such as Wilson and Kaplan suggest adaptation value of aesthetic can be linked to psychological well-being and self-confidence (Wilson 1993, 49-51).

Symbolic

This typology reflects humans' use of nature as a means of communication and expression. The development of the human language is directly linked to nature. The natural environment is abundant and diverse with flora, fauna, and forms. This setting provides complexity and variety that create an optimal intersection for humans to differentiate and categorize in order to survive. Studies by Jung (1959), Campbell (1973), Bettelheil (1977), and Sheperd (1978) show the importance of natural symbols in story, myth, and legend as important tools for dealing with developmental problems, such as identity, expressive thought, selfhood, and abstraction (Wilson 1993, 51-52). Ninety percent of characters used in language acquisition and counting in children's preschool books are animals (Wilson 1993, 52). This statistic is evidence of how humans use symbols derived from nature to learn and communicate.

Humanistic

Humans have deep emotional feelings toward nature, especially animals. Humans are a social species and were dependent on a cooperative coevolution with other species, especially wolves. Along with this adaptation perspective, humans enhanced their capacity for sharing and altruism (Wilson 1993, 52-53). These feelings are also often expressed towards landscapes and flora. This typology is sometimes equated with a love for nature, and results in stewardship and care for elements in a natural environment.

Moralistic

This experience in nature is grounded in ethical responsibility for the natural environment. Spiritual meaning is found and connected to nature. This typology is often associated with indigenous people. Their view of nature is not as a separate entity from humans, but instead interconnected and interdependent as a whole system. An excerpt explains this perspective from Luther Standing Bear (1933: 45)

We are of the soil and the soil of us. We love the birds and beasts that grew with us in the soil. They drank the same water we did and breathed the same air. We are all one in nature. Believing so, there was in our hearts a great peace and a willing kindness for all living, growing things. (Wilson 1993,54)

Dominionistic

This typology reflects the human tendency to dominate the natural world. This tendency is evident in modern day through destruction of the rain forest, excessive waste, and climate change. However, in evolution the process of mastering nature would have been advantageous. It would have aided survival and development of knowledge in the natural environment (Wilson 1993, 56).

Negativistic

Fear and aversion of nature are the basis for this typology. Fear creates a flight or fight response behavior in the animal kingdom. The acts of avoidance, isolation, and causing physical harm to nature can be linked to a biological advantage for humans. Most conservationists view fear of and alienation from the natural environment as a tipping point for deterioration and destruction.

Kellert's typologies are useful in that they create a value system for how humans use nature and land. These typologies illustrate correlations between the human connection to evolutionary development and childhood development. Stages of childhood development can be found in the following typologies: (1) symbolic, (2) humanistic, (3) ecogistic-scientific, and (4) naturalistic. This is important to acknowledge due to the direct connection to nature play that will be explored in chapter three.

Research from Kaplan, Cobb, Moore, and Kahn has been studied to develop characteristics relevant to designing a natural environment focused on play. There are five characteristics; (1) legibility, (2) variety, (3) mystery, (4) sensory, and (5) accessibility.

Characteristics

Legibility is involved in a users' perception of the landscape as three-dimensional (Kaplan, 13). The key to legibility lies in the distinctiveness of a place. A landscape with memorable elements will add to the legibility of the place, and increase the user's ability in way-finding (Kaplan 1998, 15).

Variety increases the user's exploration of an environment. A landscape designed with multiple elements and layering increase the experience and therefore richness of the setting (Kaplan 1998, 14).

Mystery can create opportunities for the user to further explore a landscape. Through design elements can be utilized to suggest that there is more to experience, and therefore be compelling (Kaplan 1998, 16).

Sensory refers to the landscape's ability to engage the user's five senses; (1) sight, (2) smell, (3) taste, (4) touch, and (5) hearing. Humans' perception of nature is key in developing the relationship. Experiencing a landscape through the five senses creates perception. Scholars such as Kahn (2002), Moore (1983), and Cobb (1977) theorize that interaction with a physical environment is paramount to engaging the senses, and thus the imagination for development (Cobb, 29). A sensory designed landscape can enhance the natural setting by encouraging exploration and also creating a memorable experience.

Accessibility refers to the theory of universal design for the purpose of this thesis. Universal design is providing access to a space for all humans, and focuses on the anthropometrics and spatial needs of people with disabilities (Driskell 1993, 17). Americans Disability Act (ADA) design guidelines and standards have been implemented by the U. S. Department of Justice, and continue to be the structure for designing a space with universal access. Designing an outdoor space with universal access is complex. However, through implementing universal access in a design for a natural environment, a larger population of users, specifically children and seniors can be reached.

Through synthesizing the literature from this chapter, a foundation for creating the tangible elements of the nature play network have been defined. The following list is a summary of the key points from this chapter that inform the development of the nature play network.

- Humans relationship with nature can be viewed through the lens of biophilia
- Biophilia tendency can be assigned value through Kellert's typologies
- Five characteristics for the nature play network have been developed; legibility, variety, mystery, sensory, and accessibility

In the following chapter, the history and significance of play in childhood development will be examined, nature play and its benefits will be defined, and the tangible elements of the nature play network will be introduced.

CHAPTER 3

History and Significance of Play

Play has prehistoric roots, and has been a part of human experience prior to the onset of rational thought, and was probably a part of the lives of prehistoric human beings (Frost 2001, 5). Unfortunately, play was not always deemed important enough to be documented. However, the ancient Greeks thought differently. The following is a clear example of how Plato viewed the importance of play, “You can discover more about a person in an hour of play than in a year of conversation” (Klostermann-Ketels 2011, 80). Aristotle and Xenopanes used philosophical discourse to understand human expression and thought. They developed three concepts for understanding play: agon, mimesis, and chaos.

Agon represented conflict and competition. The ancient Greeks believed their gods created challenges for humans as a means of interacting or playing with them. These challenges placed humans in competition with one another, and the gods then blessed whomever won. The ancient Greeks developed competitions that we use in modern day, the Olympics (Frost 2001, 7 & 8). This concept has formed modern thought about play in relation to games.

Mimesis describes the act of mimicry. The ancient Greeks wanted to mimic the gods as a form of adoration. They exhibited this through forms of self-expression in rituals, theater, and symbols (Frost 2001, 8). This was a form of imaginative play and is observed and practiced by children and adults in modern day.

Chaos is the concept developed by the ancient Greeks to organize humans' relationship to nature. From chaos they derived the idea of chance, and the role it plays in the divine. They used the act of throwing bones and reading the patterns as a way to gain understanding from the gods. These acts of randomness produced patterns that were then read as messages from the gods. This practice incorporated the idea of chance in their belief system of the divine (Frost 2001, 8). Games of play that involve elements of chance are also found in modern day, such as pick up sticks or cards.

The 17th century was a historic period with great thinkers like John Locke, Immanuel Kant, and Friedrich von Schiller. These philosophers explored the mind and behaviors. Locke believed each human was born with a rational mind that was shaped through experiences. Simply stated we are what we learn, and are not born with predisposed ideas about the world. In 1693, Locke identified play as an important component to development in Some Thoughts Concerning Education. He viewed play as contributing to the health and spirit of children (Frost 2001, 9).

Kant's writings dealt with reason and knowledge. He theorized about how humans attain knowledge. Though his work did not involve children, Kant surmised that adult imagination is the context where reason and knowledge operate. Imagination and play drive humans to pursue knowledge. Through this theory, play is linked to cognitive learning (Frost 2001, 10).

The Enlightenment era was progressive through art, music, and philosophical thought. Friedrich von Schiller declared play as a key part of humans in his writings. His work contrasted work and play. Work was necessary in order to meet our needs, and therefore required energy.

Energy left over was for play. He viewed play as an expression of spirited energy. Play was exploring, being creative, and to leave behind the work or labors of the day (Frost 2001, 10). Schiller's writings roots play in the physical world.

The Romantic Movement occurred in the second half of the 18th century in natural progression from the Enlightenment. This historic period was in part a reaction to the Industrial Revolution and social/political norms. It was instrumental in elevating education and the arts. Swiss educator Johan Pestalozzi was innovative in his approach to education. He thought children should learn through experience with real things, instead of the standard means of rote memorization. Pestalozzi's radical method of teaching was practiced in his Swiss school as "object lessons" (Frost 2001, 11).

Friedrich Froebel was a German educator and a student of Pestalozzi's Swiss school. His experiences and education lead him to view nature as a means to learn through self-initiating experiences. He created a curriculum based on activity and play with objects in physical science (Frost 2001, 11). He is credited with the creation of kindergarten, or children's garden.

In 1837, Froebel established his Play and Activity Institute in Germany. Froebel's kindergarten consisted of the following three activity based learning methods:

- Dances, songs, and games for healthy activity
- Simple toys used in sedentary creative play (Froebel calls these gifts & occupations)
- Observing and caring for plants in a garden

Froebel was instrumental in acknowledging play as essential to learning, and instrumental in developing a curriculum for play in education. His methods also echo the culture of his time. He created song, dance, and play based on the mother child relationship. This play was informed through the daily activities of an agrarian society, such as care taking for animals and making bread. As a result, children today still participate in this play through common activities like 'patty cake patty cake' and 'beckoning the pigeons' (Frost 2001, 14). Froebel was a pioneer in identifying childhood development through play and education, and creating a curriculum to apply his theories. Building blocks, balls, and circle time are a few of his 'gifts & occupations' that can be found in most kindergartens today (Frost 2001, 15). Through connecting play and education, Froebel also identified that certain places were more conducive to learning. He surmised that play can happen anywhere, however educational play occurs in planned settings (Frost 2001, 16). This is valuable information for a myriad of professionals involved with the planning and design of environments focused on children.

In the post-Darwin era, the study of play evolved beyond philosophical thought and into a more scientific realm. Darwin's theory about evolution and adaptation influenced 19th and 20th century scholars of play (Frost 2001, 17). Herbert Spencer combined aspects of Schiller's writings on 'surplus energy as play' with Darwin's evolutionary theory.

He proposed that play from surplus energy was a means for developing natural instincts, such as identifying danger and thus in line with natural selection (Frost 2001, 16). Play assisted children in developing their natural instincts, and translates into mental, physical, and social skills.

Stanley Hall was the founder of the child study movement in the 19th century, and focused his work on creating a scientific method for studying child development (Frost 2001, 17). He proposed the theory of recapitulation based on Darwin's theory of adaption. Recapitulation theory suggests, "each organism will recreate the evolution of the species in its organic development" (Frost 2001, 17). His theory of recapitulation has been rejected through modern scientific study of DNA, however his approach of applying the scientific method to studying the stages of childhood development created a new perspective with which we continue to use today (Frost 2001, 17-18).

Karl Groos was a naturalist and wrote two books on play pertaining to humans and animals. He continued to explore Darwin's theory and suggested that play had an adaptive purpose in development. He defined play as an adaptive process that served the survival of the species. He identified this function in the following terms, preexercise or practice. His study of species development focused on periods of immaturity, specifically birth to adulthood. He surmised that the period of immaturity was critical for a species in developing survival skills for adulthood (Frost 2001, 18-19). The period of immaturity varied for species, and was more complex for mammals. Groos classified two types of play that were functional to human

development: experimental and socionomic. Experimental play develops motor and sensory skills, and socionomic play develops interpersonal skills (Frost 2001, 19). His theories help to strengthen the value of play in childhood development, however they are difficult to measure and he does not account for creative play, which develops cognitive, social, and emotional skills.

John Dewey continued the study and theory of play in the 20th century. He was a great American philosopher and critic of education (Frost 2001, 21). He worked at the University of Chicago and created a laboratory school to study and refine his theories about education. He believed that education is based on the experiences of students, and that the values of democracy and freedom should be incorporated into education (Frost 2001, 21). Dewey wanted to identify how play contributed to education. Therefore he studied and wrote about play in the following two ways:

- Structured play, general knowledge
- Free play, exploration of nature and society

He viewed play for children as a necessary means for them to learn. He saw play actions as imperative. He thought a child must participate in an experience in order to fully conceptualize the idea behind the experience (Frost 2001, 21). Simply stated, he supported learning by doing.

Dewey constructed a bridge through his research of play and its relevance in education, creating a foundation for the modern study of play that continues today. Modern play theory

evolved sharing the Dewey's fundamental premise that play allows children to create meaning through experience and also express their own individual wills (Frost 2001, 22). Play is an important developmental stage both mentally and physically to children.

Charles Darwin's *Origin of Species* continued to influence society and scholars in the 19th and 20th centuries. A myriad of disciplines began exploring Darwin's theory and applying it to their body of research. This multi-disciplinary approach has yielded a complex perception of play for modern times, and elevated the importance of play.

Sigmund Freud was a medical doctor who dramatically changed the discipline of psychotherapy. He created psychoanalytical theory based on his interpretations of human behavior and how culture and genetics (biological) influence behavior (Frost, 39). He developed a structure for defining a personality (ego, id, and superego) and assessed the contribution of nature and nurture to the development of a personality. His theory defines id as the biological drives that are innate in humans, such as sexuality, hunger, and social contact. Superego, also known as conscience, is developed from internalizing social limitations during childhood. Freud surmises that the interplay of id and external social limitations forms an individual's ego, and this process happens subconsciously (Frost 2001, 39).

Freud's theory of personality simplifies how a child emerges in to an adult. Parents are a child's first contact with the outside world, the foundation for a child's development.

Teachers, family members, playmates, and other community members also participate in the development of a child. The balance of biological drives and external restrictions also affect the development of personality in a child. This is known as nurture versus nature (Frost 2001, 39).

Play has an important role in development. The environment of play allows a child the opportunity to use its imagination, engage with other children and adults, and explore the limits of physical, mental, and social boundaries.

Freud's followers, Erik Erikson and Lili Peller, sought to further explore his theory of personality and the relationship of play in development. Erikson viewed play as a window into the personality formation of a child, and as an important part of early socialization. Both Erikson and Freud subscribe to the idea that play is a means for children to navigate the relationship of nature and nurture. To them play is a reflection of the past, present, and potential future. Peller adds a different perspective in that play is not necessarily a reflection of the child's reality. She proposes that play could also be a reflection of what the child wishes his/her reality would be (Frost 2001, 41).

Psychoanalytic theory about play and childhood development provide the following key points:

- Play is an important developmental activity that facilitates and shapes an individual.
- Play provides an opportunity for a child to heal and resolve problems.
 - Feelings are an important part of play (Frost, 41).

Gregory Bateson, an anthropologist, added significantly to play theory by his research on adaption. He connected communication and play in his 1972 publication “Theory of play and fantasy”. He proposes that through evolution humans have developed the cognitive ability to imagine and create things that are not a part of our present state. Through play humans are able to create a scenario of the future, or recreate a scenario from the past, as they want it to be (Frost 2001, 42). He describes points in time when a child uses signals and other forms of communication as play frames. These play frames define the time and space for the realm in which children begin to engage in imaginative play. The play frames and the signals implemented to acknowledge play are important to human evolution and a child’s development. They allow flexibility and space for a child to explore their imagination, moving in and out of different roles and settings. Bateson’s research indicates another important factor of play in that it provides a safe space for children to take on roles and learn behavioral signals from others (Frost 2001, 43).

The importance of this discovery amplifies the magnitude and significance of play in human development. Play can be a medium for healing, exploring imagination and countless possibilities, and communicating needs and desires.

Lev Vygotsky researched the importance in play in cognitive development and also the role of play in a child's life in terms of social and cultural shaping. He writes that through play children are able to develop crucial skills related their place in society and to important people in their lives (Frost 2001, 50). As children grow and their play develops, peers and adults participate to aid them in acquiring new skills (Frost 2001, 50-51).

Jean Piaget was a Swiss scholar and greatly influenced research on cognitive development in play. His seminal work, Play, Dreams, and Imitation in Childhood, is the tremendous analysis of the role of play in intellectual development. Piaget's work has been refined by new research and insight, however the impact of his research served as a catalyst, for educators and researchers as they fight for the central role play has in cognitive development (Frost 2001, 46).

Piaget viewed play as an experience for assimilating objects in the environment, and therefore developing intellect for relationships and structure. Piaget developed stages for cognitive development in relation to specific ages of child's development. The stages are defined as follows: (1) functional activity, (2) symbolic play, and (3) games with rules. Functional activity refers to exploratory and sensory motor behavior, and typically is found in the first years of a child's life. Symbolic play further explores the sensory motor skills through

activities of construction, and also incorporates the use of imagination as a child represents a life-like experience in play. Games with rules are an advanced stage of cognitive development, where reason is often applied to sensory motor skills (Frost 2001, 47). The refinement of these contemporary play theories is important in the design process of nature play. Each designed space must be appropriate, safe, and enhance the child's environment.

Nature Play

For the past few decades, scholars across many disciplines have been researching the benefits of nature play. Educators and designers have been researching methods and guidelines for establishing play in natural environments for children. Through years of research in developmental psychology, studies have shown the importance of free play in the development of children. Simply stated, play is essential in childhood development. There are also years of research that prove the importance of contact or connection to nature for healthy development. Scholars such as Kahn, Kellert, Moore, Taylor, Gardner, and Kuo have researched and agree that children prosper developmentally, socially, physically, and spiritually from contact with nature. This growing body of research shows the importance of free play in nature or more commonly referred to as nature play. A growing body of research suggests that contact with nature is as essential to physical, mental, and spiritual growth as nutrition and sleep (Kuo 2010, 5). The experiences found in nature play aid children in the development of self-confidence, problem solving, creativity, communication, and an overall understanding of the natural world. Through childhood experiences in nature, children are more likely to grow

up with respect for natural systems, and therefore become stewards for the environment. Thus participating in the “pay it forward” or “7th generation” mentality, which promotes a better environment and creates opportunities for better health.

Benefits of Nature Play

The benefits of nature play can be seen in research from many different disciplines, and adds clarity and credence to the importance of this issue. An overview of the health benefits related to nature play has been addressed, and the following benefits have been identified for the nature play network: (1) cognitive, (2) social, (3) emotional, (4) cultural, and (5) educational.

Pioneers in the fields of conservation, ecology, and landscape architecture have claimed the health benefits associated with nature. Frederick L. Olmsted designed Central Park in New York as place for the citizens to have access to nature and ultimately give them an opportunity to increase their health. John Muir devoted his career to relentlessly advocating for the protection and conservation of natural areas in the United States for future generations based on the belief that nature had essential qualities, which were physically, mentally, and spiritually healing. Many designers intuitively feel that access to nature is beneficial to physical, social, and mental health. Research from the last decade supports the claims from Olmsted, Muir, educators, advocates, and designers around the world. Health benefits have been measured objectively through blood pressure, standardized neurocognitive tests, physiological immune system functioning, and crime reports (Kuo 2010, 3). A study done by Roger Ulrich has shown that people who watch images of a natural landscape after a stressful experience are able to be

calm in about five minutes, and the readings of their pulse, muscle tension, and skin-conductance decrease rapidly (Louv 2005, 46). This research echoes that access to natural environments affects the well being and functioning of the three trademark domains: psychological, social, and physical (Kuo 2010, 4).

The lifestyles of humans have become much more sedentary, which contributes to the alarming rate of childhood obesity. The Center for Disease Control (CDC) reported that from 1989-1999 the number of overweight children between the ages of two and five increased thirty-six percent (Louv 2005, 47). Moreover, the obesity rate for children has more than tripled in the last thirty years. The percentage of obesity in children ages six to eleven increased from seven percent in 1980 to nearly twenty percent in 2008. During the same time period, there was an increase in obesity of adolescents ages twelve to nineteen from five to eighteen percent. In 2008, more than one third of children and adolescents were overweight or obese (CDC, 2012). Obesity in children and adolescents increases the risks of other health problems. They are more likely to have cardiovascular disease, diabetes, bone and joint problems, and sleep apnea. They are also more likely to have social and psychological problems. Obesity in children also increases their likelihood of being an obese adult. The long-term health risks associated with this include diabetes, heart disease, stroke, several types of cancer, and osteoporosis.

Cognitive & Social

Other health benefits are seen through cognitive and social development, and also in therapeutic and restorative practices. The concept of nature and gardens as a therapeutic

antidote and restorative are ancient. The Chinese Taoists created gardens and greenhouses over two thousand years ago based on the belief that they were beneficial to health. In the late 17th century, the book English Gardener described spending time in your garden as a means to preserve health (Louv 2005, 45). The first garden club of America was created in Athens, GA in 1891 as a way to increase the health of its members. Today, there are niches within landscape architecture, horticulture, and gardening specifically focused on therapeutic landscapes. Emotional development can be fostered through these disciplines and their application of designed landscapes. Horticulture therapy is found throughout the world, and crosses boundaries of age, race, sex, and socioeconomics.

Stephen Kellert has researched the cognitive and social benefits of nature in the development children. The area of knowledge formation is greatly influenced by the natural world. Children are able to understand facts, create categories, and identify relationships using all of their senses (Kahn & Kellert 2002, 122-123). In a study of over seven hundred adolescents involved in Outward Bound, the National Outdoor Leadership School, or the Student Conservation Association, he and his colleagues found the experience had greatly increased their self-confidence, self-concept, their capacity to interact with other, and their ability to handle challenging situations (Kahn & Kellert 2002, 136-137).

Education

The loss of physical activity in our educational system has increased in the past few decades due to pressure for better performance on standardized tests. However, there is growing advocacy and action for bringing the children back out into nature for education. More

and more schools are creating gardens on their grounds and also initiating programs to get the children back in nature. One example is the award-winning program from North Carolina, Muddy Sneakers. They have supplemented the fifth grade science curriculum with this program that teaches science in the field. There are hundreds of natural learning schools throughout the world today. Jon Young has been an advocate for connecting children to nature for decades, and created the first Wilderness Awareness School in 1984 (Young 2010, foreword). Parents, community members, advocates, and educators are taking action to ensure that children are not being denied one of their fundamental rights, to play in nature. In the last few years, coalitions and networks, such as No Child Left Inside and the Children & Nature Network, have been created as response to the growing decline in children's contact with nature. Their primary focus is increasing environmental education for children. Programs, schools, and initiatives promoting nature play are providing a source of education to children.

Howard Gardner, professor of education at Harvard University, developed a theory in 1983 about intelligence. His theory proposed that multiple intelligences exist in humans (Gardner 1999, 33). Gardner defines intelligence as the following, "a bio psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (Gardner 1999, 33-34).

His theory of multiple intelligences proposes that the potential of different intelligences must be activated through culture, family, or school (Gardner 1999, 34). Gardner's theory of multiple intelligences challenges the traditional I. Q. testing commonly performed to assess a person's intelligence. His original theory proposed seven types of intelligences: (1) linguistic, (2) logical-

mathematical, (3) spatial, (4) musical, (5) bodily-kinesthetic, (6) interpersonal, and (7) intrapersonal (Gardner 1999, 41-43). He recently added more types of intelligences to his theory, one of which is naturalistic. The naturalistic intelligence encompasses an individual's ability to recognize species; to distinguish among member of a species; to recognize the existence of other, neighboring species; and to recognize relationships among multiple species (Gardner 1999, 49). It is important to acknowledge the direct correlation of this naturalistic intelligence to nature play as an integral part of education. The benefits of nature play to education exist in creating a generation more in touch with environmental awareness.

Cultural

Pioneers such as Jon Young, Evan McGowan, and Richard Louv believe our society is in need of cultural repair due to the disconnect between humans and nature. There is a growing movement focused on connecting children to nature. In Richard Louv's book Last Child in the Woods, he describes this disconnect between the natural world and our children, and therefore the need to reconnect children to nature. The success of his book brought these tough issues to the national stage, and also created an incredible resource of information related to the children and nature connection. According to a study done by Sandra Hofferth at the University of Maryland between 1997 and 2003, there was a decline of fifty percent in children age nine to twelve who spent time participating in outside activities such as walking, hiking, gardening, fishing, and beach play (Louv 2005,34). There is a decline in the amount of time families and children spend in nature together. A study conducted by Rhonda L. Clements at Manhattanville College found that seventy-one percent of today's mothers played outside everyday, whereas

only twenty-six percent of them reported their children playing outside daily (Louv 2005, 34).

These studies are examples of the significant decline in nature play occurring in our culture.

The long-term effects of this shift on culture are yet to be revealed. In the Coyote's Guide To Connecting With Nature, mentoring is an integral part in the equation of connecting children to nature. The authors have drawn practices from indigenous cultures about connecting to nature through the art of mentoring (Young 2010, 13). Children are the future in that they will make decisions that effect land use. Designing and creating spaces where children can connect to nature will aid their development and potential environmental stewardship. Facilitating a community of mentoring through nature play will strengthen their bond to nature and culture.

Factors Contributing to the Decline of Nature Play

It is important to explore and acknowledge factors, which are contributing to the decline of nature play. By identifying these factors, strategic planning and actions can be taken to address, reduce, and possibly eradicate them. The following list identifies key factors in the decline of nature play: (1) decreasing amount of green space, (2) increasing amount of technology present in our daily lives, (3) parental or community fear of danger, (4) changing family relationships, (4) air conditioning, (5) organized play through sports & activities, and (6) increasing pressure of a solid gold resume (Louv, 116).

The decreasing amount of green space limits children's access to connecting with nature and participation in nature play. As urban areas grow, more and more green space is being erased from the Earth. Planners and designers should consider the ramifications of declining green space in their designs, and work to protect existing green space and create more green

space. The rapid increase in technology is affecting our society, in that humans spend more time engaged with 'screens' much more than a generation ago. Studies released in 2005 and 2006 conducted in association with the Kaiser Foundation found that children between the ages of eight and eighteen years old spent an average of nearly six and a half hours per day with electronics (Louv 2005, 119).

In the past few decades, there has been an increasing fear for parents and communities regarding danger of children playing outside without supervision. The increase in media coverage has also heightened this fear. This parental fear is affecting children's' access to nature. However, a study in 2007 by the Duke University Child and Well-Being Index reported the rates of violent crimes against children had fallen to levels below those in 1975 (Louv 2005, 127). On the other hand, families and communities are different than a few generations ago. The support structure of neighbors and extended relatives has decreased due to more and more family members moving away from their hometowns. Parents working more and having less time at home with children also compound this dynamic. In the book, Last Child in the Woods, Richard Louv explains the disconnect from nature is further amplified due to air-conditioning. According to the U.S. Census Bureau reports, housing with air conditioning increased sixty-six percent between 1910 and 2001. Louv believes this increase directly affects humans by decreasing their sensual exposure to natural elements (Louv 2005, 58). The increase in organized sports and activities also affects a child's free time, and therefore time to engage in nature play.

Lastly, the increased pressure to create and have a resume of solid gold is interconnected with the increase in organized sports and activities. The promise of a successful future is often coupled with higher education. This promise in turn places children in the 'rat race' long before adulthood. Parents and children organize and plan a route of schools and outside activities that will increase the child's opportunities for higher education. This may not be a negative dynamic unless it decreases the child's access to play and develop in nature.

This chapter has shown that play is essential to human development, and connection to nature and nature play increases multiple benefits for children. The following is a summary of the benefits developed for the nature play network:

- Cognitive play can be achieved through landscapes that foster activities that will lead to problem solving and thinking. Natural environments that have variety and richness of elements can increase the opportunities for cognitive play (Frost, 173).
- Social play is part of the neuro-typical development of a child, and increases with the cognitive development of a child (Frost, 235). Landscapes that encourage games and group activities achieve social play.
- Emotional development is linked to cognitive and social development. Emotional development can be fostered by experiences in nature. These experiences in nature can be solitary, with peers, or with a mentor. The exploration of life and life like processes in nature can be integral to emotional development.
- Cultural experiences can be achieved through design. Elements, both tangible and intangible, can be utilized to create an experience that connects a child to their culture. Nature is rooted in human culture, and is an opportunity for a child to create bonds with a setting, peers, and mentors.
- Educational benefits refer to the ability for a natural setting to enrich the connection and experience for a child. Through these experiences a child is exposed to life and life like processes, which provides the living laboratory to develop a naturalistic intelligence.

From this research, a foundation for the tangible elements and benefits for the nature play network has been developed. The benefits are identified in the matrices for the nature play network as the following: (1) cognitive, (2) social, (3) emotional, (4) cultural, and (5) educational. Cognitive, social, and emotional represent the health benefits discussed earlier in this chapter. The tangible elements are identified in the matrices for the nature play network as the following: (1) loose parts, (2) stationary objects, (3) water, (4) open spaces, (5) topography, (6) vegetation, (7) pathways, (8) wild places, and (9) ephemeral. These tangible elements are addressed and defined further in Chapter Five.

CHAPTER 4

Finding Meaning In Landscape

Landscape has been a source of meaning to humans for millions of years. It is important to review and interpret the meaning of landscape for humans in that it contributes to the perceptions humans have for land, and thus translates into their meaning and uses of the land. Landscapes are powerful settings for humans, and transcend time and culture. In creating landscapes, humans give physical form to reflections of their experiences. Thus, landscapes connect humans to the past and to the present (Francis & Hester 1990, 2). Landscapes are an integral part of human existence. The meaning of landscapes can be defined by identifying idea, place, and action associated with their creation. Idea refers to the social thought of humans when developing a landscape (Francis & Hester 1990, 2). Place refers to the physical location of a landscape, and the human interaction with that natural setting (Francis & Hester 1990, 5). Action refers to the direct and intimate contact humans have in shaping a landscape (Francis & Hester 1990, 6). The meaning of landscapes is dependent on the idea, place, and action humans utilize in order to create or identify a landscape. Therefore, there is a distinction between the meaning of landscapes and the human relationship with nature (biophilia). The meaning of the landscape shapes the human relationship with nature. In turn, the human relationship with nature can be classified in terms of value and use, which was described in Chapter Two. This chapter will explore the meaning of landscapes and create a platform for

developing the intangible elements of the nature play network. The meaning of landscape is connected to language, and how humans have evolved with nature.

Anne Whiston Spirn describes the landscape as language in the following excerpt:

The language of landscape is our native language. Landscape was the original dwelling; humans evolved among plants and animals, under the sky, upon earth, near water. Everyone carries that legacy in body and mind. Humans touched, saw, heard, smelled, tasted, lived in, and shaped landscapes before the species had words to describe what it did. Landscapes were the humans first texts, read before the invention of other signs and symbols. Clouds, wind, and sun were clues to weather, ripples and eddies signs of rocks and life under water, caves and ledges promise shelter, leaves guides to food; birdcalls warnings of predators. Early writing resembled landscape- verbal, mathematical, graphic- derive from the language of landscape (Spirn 1998, 15).

Spirn explores landscape as language, and thus illustrates the importance of landscape to humans. The meaning of landscape is connected to language, and how humans have evolved with nature. Landscapes can be narratives, which then creates meaning. The physical elements coupled with the history of a landscape can be interpreted to tell a story and give meaning to a specific area.

This research studies the meaning of landscape in a specific area, southern Blue Ridge Mountains, and for a time period that chronicles from the presence of the Cherokee to modern times. The Cherokees are descendants of the Mississippians, and resided in a vast area covering eight states in the southeast. The author has chosen to focus on the population of the Cherokee from the southern Appalachian Mountains, specifically southern Blue Ridge Mountains, for the purpose of the research.

The Cherokee's view of nature is paramount to defining their relationship with the natural world. The environment of the southern Appalachian Mountains was an integral and significant part of their culture. Their coexistence with the land was deeply interconnected with their cosmology. Thus, the meaning of landscape served as a foundation for their culture through cosmology and language. The Cherokee cosmology is conceptualized through exploration of their myths, sacred places, and ceremonies. A summary of two Cherokee myths of origin and a description of one of their sacred spaces has been included to express the cosmology of the Cherokee.

The Cherokee myth called *How The World Was Made* explicitly describes how the landscape was created for them. The following is an excerpt from James Mooney's book, Cherokee History, Myths, and Sacred Formulas, describing the myth:

At first the earth was flat and very soft and wet. The animals were anxious to get down, and sent out different birds to see if it was yet dry, but they found no place to alight and came back to Galunlati. At last it seemed to be time, and they sent out the Buzzard and told him to go and make ready for them. This was the Great Buzzard, the father of all buzzards we see now. He flew all over the earth, low down near the ground, and it was still soft. When he reached Cherokee country, he was very tired, and his wings began to flap and strike the ground, and wherever they struck the earth there was a valley, and where they turned up again there was a mountain. When the animals above saw this, they were afraid that the whole world would be mountains, so they called him back, but the Cherokee country remains full of mountains to this day (Mooney 2006, 239).

This origin myth illustrates the intimate relationship between the Cherokee and the natural world. From the beginning of time in their cosmology, the Cherokee are linked to the landscape and it has great meaning to their culture. Through their cosmology the Cherokee believe their land is unique from the other land, and was created specifically for them as Cherokee country. The landscape has a narrative and embodies the spirit of the place (genus

loci). Another origin myth that expresses the meaning of landscape for the Cherokee is called the First Fire. This myth expresses the interconnection between the landscape, animals, and the Cherokee. The following is another excerpt from Mooney:

Now they held another council, for still there was no fire, and the world was cold, but birds, snakes, and four-footed animals, all had some excuse for not going, because they were all afraid to venture near the burning sycamore, until at last the Water Spider said she would go. This is not the water spider that looks like a mosquito, but the other one, with black downy hair, and red stripes on her body. She can run on top of the water or dive to the bottom, so there would be no trouble to get over to the island, but the question was, how would she bring back the fire? "I'll manage that," said the Water Spider; so she spun a thread from her body and wove it into a tutsi bowl, which she fastened to her back. Then she crossed over to the island and through the grass to where the fire was still burning. She put one little coal of fire into her bowl, and came back with it, and ever since we have had fire, and the Water Spider still keeps her tutsi bowl (Mooney 2006, 241-242).

The meaning of landscape for the Cherokee can be identified through their narratives, language, ceremonies, and sacred spaces. One of the Cherokee's sacred spaces is Blue Hole Spring. It is located at Red Clay State Park in Tennessee, which is the last time and place the Cherokee held council before the Trail of Tears. Blue Hole Spring was a sacred space and the water was used for ceremonies. The landscape of Red Clay State Park is comprised of rolling lawn areas and dense woodlands. A small stream meanders through the park and culminates at Blue Hole Spring. The topography surrounded the spring creates a bowl, and is enclosed by vegetation. The depth of the spring is unknown, and the brilliant shades of blue from the water aid the mystery. The contrast of this element in the natural environment of the park creates the background for the genus loci. Water was not only a necessity for life for the Cherokee, but also had a spiritual presence in their culture, thus creating meaning in the landscape. This sacred space illustrates genus loci, narrative, and respite & renewal. The topography and water

create the *genus loci*, and also provide the background for the Cherokee to develop a narrative for this landscape. The Cherokee are also engaging with the landscape through the means of respite and renewal. This sacred space offers a place to pause and reflect.

Although topography was rooted in their cosmology, it also framed the physical design of the settlement areas for the Cherokee. Cherokee settlements were oriented toward rivers throughout the southern Appalachian Mountains. The design of their settlements near water was a result of their daily ritual of bathing, and also gave them access to fresh water for drinking and hunting (Davis 2000, 60). The Cherokee collected acorns from the forest, grew crops, and harvested fruit, medicinal plants, and river cane. Hunting was a part of their culture and provided not only food, but also clothing and elements for their ceremonies. Although their settlements were in lower elevations and near water, the Cherokee land encompassed ridges and peaks throughout the southern Appalachian Mountains. The forests were used for hunting and gathering, and the mountains served multiple purposes in their life: (1) hunting camps, (2) trade and warfare routes, and (3) a role in their cosmology (Davis 2000, 60-61). Topography, such as mounds, was also instrumental in settlement orientation, ceremonies, and rituals. The Cherokee's cosmology played an important role in creating narratives and meaning from the landscape their lives.

The landscape had a tremendous multi-layered meaning for the Cherokee through topography, water, flora, fauna, and inert elements. Their culture was connected to nature through agriculture, cultural arts, hunting and gathering, settlement patterns, and ceremony.

Until their removal on the Trail of Tears in 1838, the Cherokee's vast land continued to decrease as white settlers moved further into the southern Appalachian Mountains. The

Cherokee's way of life and culture was also changing due to these circumstances. The Cherokee had been engaged in trading with the white settlers of the Carolinas and Virginia as early as the 1670s, and by 1716 regular trading was occurring (Davis 2000, 61-61). Over the course of the next 100 years, trading had a significant impact on the natural environment. Fur trading caused the loss of millions of animals, and by the height of fur trading between 1739 and 1761 buffaloes and elk began to disappear from the southern Appalachian Mountains (Davis 2000, 66-67). The trading between the Cherokees and the white colonies also including plant material such as ginseng, and thus impacted the environment (Davis 2000, 67). The ecology of forests and streams was greatly affected by the loss of the beaver population in the eighteenth century due to fur trading (Davis 2000, 67). Along with the loss of biodiversity in flora and fauna, the Cherokee were introduced to new tools for agriculture and hunting. These advances in technology dramatically impacted the culture of the Cherokee. They adopted cattle herding, and as a result large breaks of river cane, a traditional plant used for basketry, were reduced greatly (Davis 2000, 72). The loss of their land coupled with the ecological impacts of trading with white settlers left the majority of Cherokee reliant on European goods (Davis 2000, 79).

It is important to acknowledge this rapid shift in culture and ecology, because it directly relates to a shift in the meaning of landscape that transpired during this time period. Although the natural environment remained an integral part of their culture, the Cherokee were adapting to the changing times and seeking to coexist in the land with the white settlers. As the majority of Cherokees were removed from the southern Appalachian Mountains, the white settlers

continued their expansion into the region, and with their culture came another layer of meaning of the landscape.

The southern Appalachian Mountains were impacted greatly by white settlement over the next one hundred and fifty years. Pioneers of this new frontier viewed the natural environment differently than the Cherokee. Some of the native practices and knowledge of the Cherokee were shared with traders, and therefore became integrated into the culture of white settlement (Davis 2000, 79). However, white settlers preferred the pastoral landscape to the forests. From Europe, the white settlers brought their meaning for landscape, which was pastoral. The pastoral landscape can be described as a natural environment where one can retreat from the stress of daily life, and enjoy the regenerative spirit of an open landscape typically through passive recreation (Marx 1964, 3). The meaning of landscape from a pastoral perspective is respite and renewal.

Due to their meaning of landscape, they settled into large open expanses of land, and viewed the large forests as inhabitable (Davis 2000, 97). They came from England, Ireland, Scotland, Germany, and Scandinavia and brought their skills for developing the land. The Scots-Irish were familiar with the soil of the region due to its similarities with their native land, and thus primarily focused on agriculture. Germans preferred level land and practiced clear-cutting. Each group of white settlers contributed to the development of land through their unique skills such as: masonry, carpentry, logging, and agriculture. The meaning of landscape was be affected by their value system, and how it could be manipulated to serve their needs for survival and progress.

The timber logging was the greatest example of the white settlers mark on the landscape. Old growth forests were decimated during this time period. Mining and agriculture also impacted the environment as the population continued to grow in the region. Antebellum livestock production, manufacturing, and increased transportation routes aided the white settlers in changing the land (Davis 2000, 128-131). With the advancement of the railroad industry and infrastructure of the mid to late seventeenth century, the landscape of the southern Appalachian Mountains would be witness to the greatest environmental impact by humans (Davis 2000, 166). The impact of timber logging during this time period caused erosion, flooding, and fires in the southern Appalachian Mountains. As a result, Gifford Pinchot was assigned the task of implementing sustainable forestry practices in the Blue Ridge Mountains. During the late seventeenth century and early eighteenth century, politics became involved in land uses that were causing destruction to the environment. This intervention laid the groundwork for a shift from the meaning of landscape. Prior to the intervention of the government, the preference of the landscape remained pastoral and was greatly affected by capitalism. As policies and influential people became involved, a shift from pastoral to one of national treasure and identity was being formed. Advocates for the natural environment, such as John Muir associated spiritual meaning with the landscapes of America.

The impact of the industrial logging to the southern Appalachian Mountains spawned the creation of federal and state agencies. In 1911, Congress passed the Weeks Act, which authorized the acquisition of large tracts of land within the watersheds (Davis 2000, 171). Gifford Pinochet, William L. Hall, and others within the new federal agency were pioneers in the conservation and study of the southern Appalachian forests. The meaning of landscape

remained pastoral during the industrial logging period, however the addition of policy was creating a foundation for conservation that would inform modern day landscape meaning.

Although the Weeks Act increased protection through land acquisition, industrial logging continued and was intensified by World War I in the early 1900s (Davis 2000, 172). By 1930, more than four million acres of land had been acquired by the federal agency and boundaries for national forests had been decided. Pisgah National Forest was created in 1916, and was the nation's first national forest in the southern Appalachian Mountains (Davis 2000, 173). The perceptions of land use were shifting to conservation, preservation, and human recreation. The meaning of landscape from this period to modern times is closely aligned with national identity and personal ethics. Landscapes are wild and yet managed. They are protected and yet host millions of visitors each year. The meaning of landscape is found in the unique identity of a natural area. This identity is created from natural elements and by cultural/historical significance. To further clarify and define the meaning of landscape for this period, the Appalachian Trail is used as an example.

The Appalachian Trail embodies all of the intangible elements of the nature play network. There is a narrative to the mountain range, and each individual landscape within it has a sense of place. The trail creates opportunities for respite and renewal. One can embark into the wildness of the mountains, and retreat from the stress of daily life. The Appalachian Trail offers views of the landscape that are unparalleled in the world. Lastly, this landscape's meaning resides in the actions taken by users to access their imagination. Through these actions one can experience a secret space and embark on Peter Pan Moments. The secret space is a place where one can retreat from others. Peter Pan Moments are opportunities

presented in a landscape to engage one's imagination. The Appalachian Trail is a landscape that has a myriad of these opportunities. The Appalachian Trail stretches from Georgia to Maine and traverses one of the oldest mountain ranges in the world. It hosts the highest mountain on the eastern seaboard, Mount Mitchell. The natural elements are varied from dense forests, to grassy balds, to slopes of scree, and open fields. These elements create a unique environment separately and holistically by exposing and engaging people with nature in some of its wildest forms. The flora and fauna in this landscape are rare and create unique ecosystems not found anywhere else in the world. The cultural and historical significance of the Appalachian Trail resides in the actions taken by advocates, government agencies, and private institutions to ensure the conservation and preservation of this landscape. The Appalachian Trail is federally protected and is also maintained by grassroots groups in each state.

The meaning of landscape of the southern Appalachian Mountains has changed over time, and the uses of land have changed in response. What remains paramount in the evolution of this process is landscape and humans are interconnected. Humans cannot survive without the natural environment. Therefore, the meaning of landscape is critical in how it shapes humans' perceptions and relationship with the natural environment. Designers and land planners are advocates and agents of change in this relationship. Their role to define, identify, preserve, and create meaning in the landscape is important as humans and nature evolve together.

The research from this chapter has identified that landscape has meaning to humans, and the meaning of landscape is shaped by the ideas, place, and actions of humans. The

meaning of landscape changes depending on the culture of humans at a specific time. This study of the southern Appalachian Mountains has created a foundation for the identifying the intangible elements of the nature play network. The following is a list of the intangible elements derived from the meaning of landscape: (1) sense of place, (2) Peter Pan Moment, (3) secret space, (4) respite & renewal, (5) narrative, and (6) views & vistas. These elements will be described in more detail in chapter five.

CHAPTER 5

Design Framework

The research of this thesis has been synthesized into a design framework for nature play. By considering theories in humans' connection to nature, play, and the meaning of landscape, a design framework has been developed for the nature play network. Nature play network encompasses the tangible and intangible elements involved in creating a place for nature play and nature connection. This chapter explores the goals of the nature play network, sets criteria for developing the framework, describes each element, and explains how to use the matrix.

The criteria for developing framework for the nature play network are a synthesis of theories from multiple disciplines such as, psychology, education, biology, sociology, and landscape architecture introduced in the previous chapters. The guiding principles of the nature play network are similar to green infrastructure. Green infrastructure is strategically planned and managed networks of natural lands, working landscapes, and open spaces that conserve ecosystem services, and also benefit the human population. Green infrastructure networks are comprised of hubs and links. Together these components create a network. Nature play network is similar to green infrastructure in that it identifies hub and links through the lens of tangible and intangible elements in the landscape. The elements of specific areas work together to create a nature play network in the landscape.

The three circles of the Venn diagram are represented by the following concepts: (1) human connection to nature, (2) play theory, and (3) landscape as meaning. The overlap of these theories and concepts are the genesis of the nature play network.

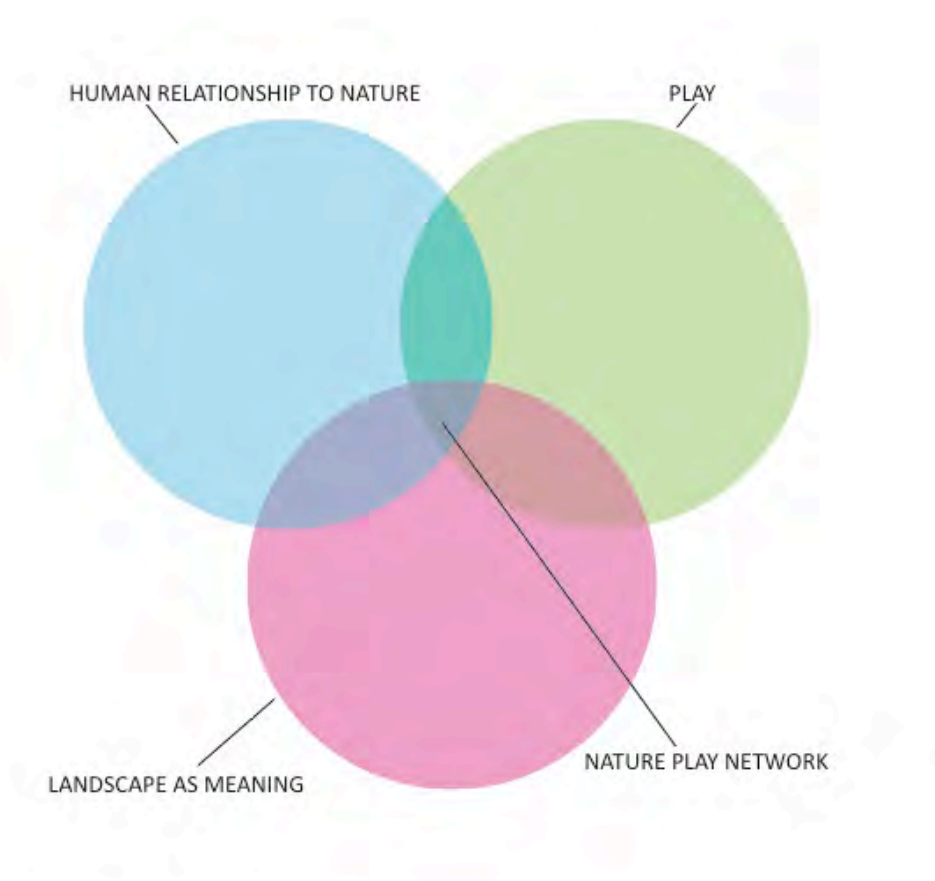


Figure 5.1 Venn Diagram: Nature Play Network

Nature play network is the tangible and intangible elements of a design that are applied to a landscape to create opportunities for nature play and nature connection. The goals of the nature play network are to create a framework that identifies specific tangible and intangible elements, which serve as hub and links for nature play and nature connection. Tangible elements were developed in Chapter Two, and intangible elements were developed in Chapter Four. These elements are evaluated based on the characteristics and benefits they provide to a landscape, which were developed in Chapters Two and Three. For the purpose of review and continuity, the characteristics and benefits developed in the previous chapters have been restated. There are five characteristics; (1) legibility, (2) variety, (3) mystery, (4) sensory, and (5) accessibility, and five benefits; (1) cognitive, (2) social, (3) emotional, (4) cultural, and (5) educational. Descriptions for each tangible and intangible element, and an example for designing these elements are provided in this chapter. This inventory and analysis is illustrated by matrices, which denote specific areas of the Southern Highlands Reserve. From these matrices, patterns emerge that inform recommendations for enhancing the nature play network.

How To Use The Matrix

The matrix can be applied to many landscapes, either rural or urban. The matrices for the nature play network are located in Appendix A. An example of the matrix is provided in Figure 5.2, in order to provide clarity with the following directions. First identify the areas within a landscape that comprise a network. The elements of the nature play network are on the far left column (y axis) of the matrix. Nature play network elements can be inventoried by assessing if the characteristics are met by the existing conditions of the area. The

characteristics are the first section on the top of the matrix (x axis). If an element is present in the area, it will be represented on the matrix by a colored cell. Next, the elements determined by the existing conditions are assessed in the benefits section on the matrix. The benefits are essentially the outcomes of the nature play network elements. The benefits are the second section on the top of the matrix (x axis). A colored cell on the matrix also represents a benefit being met. The third section on the top of the matrix (x axis) denotes a summary of the strengths (colored cell) and opportunities (hollow cell) of each element. A nature play network element receives a colored cell, thus denoting a strength, in the summary section if it has five colored cells across the two sections for characteristics and benefits. The cells in the summary section are a graphic representation of the strengths and opportunities of each nature play network element in a specific area. The next section on the top (x axis) of the matrix is denoted for a description of the existing conditions related to the specific element. The last section on the top of the matrix (x axis) evaluates design recommendations for the element of the nature play network in a specific area. This section is an evaluation of the summary column (x axis), which denotes strengths and opportunities of each element. In order to make recommendations for an element with a hollow cell, which denotes an opportunity, in the summary column (x axis), four questions are applied: (1) What are the gaps, (2) Are those gaps filled elsewhere in the network, (3) If no, where is the most appropriate place in the network to fill the gap, and (4) Where is it appropriate in this area of the landscape? In order to make recommendations for an element with a colored cell, which denotes a strength, in the summary column (x axis), two questions are applied: (1) Can this element be enhanced?, and (2) Can this element be enhanced without degrading the existing area?

This is important because not each element may be deemed appropriate for an area, and there may be another area in the network that encompasses this element and achieves the characteristics and benefits of the nature play network. The goal of the nature play network is to enhance the opportunities for nature connection within a landscape without compromising the existing conditions that offer elements, characteristics, and benefits.

Each area is further evaluated at the bottom of the matrix (y axis) in another summary section. This section evaluates each area's collective gaps and opportunities within the characteristics and benefits of the nature play network. There are a total of fifteen elements in the nature play network, and therefore the column should have seven colored cells in order to receive a colored cell on the summary line. By analyzing the matrices from the areas, gaps and opportunities will be apparent by the hollow cells. Each area matrix within the network can be analyzed to illustrate the gaps and opportunities of the characteristics and benefits of the entire network.

Tangible Elements

Tangible elements have a physical existence in the landscape. Tangible elements are most beneficial when they exhibit one or more of the following characteristics: (1) legibility, (2) variety, (3) mystery, (4) sensory, and (5) accessible. Successfully implemented tangible elements are beneficial to children in some of the following ways, (1) cognitive, (2) social, (3) emotional, (4) cultural, and (5) educational.

"Loose Parts"

Simon Nicholson wrote about "loose parts" theory in a 1971 publication of Landscape Architecture. He and Robin Moore think that an environment with a variety of elements, which

can be manipulated increase the creativity and inventiveness for children (Moore 1986, 78).

“Loose parts” are any tangible element in a natural setting, which can be manipulated and altered to serve the purpose of a child’s imagination and creativity.

- Sticks and rocks are an example of ‘loose parts’

Stationary Objects

Stationary objects are variable in size, and provide a tangible element to the natural environment from which children can explore their motor-sensory skills and imagination through climbing, jumping, crawling, sliding, and hiding. The stationary object may be natural or man-made, and should foster a connection to culture. Robin Moore states the importance and use of stationary objects in his study of adventure playgrounds. In his book Children’s Domains, one of the children climbs to the top of a wooden structure and claims he has conquered the “chair of evil” (Moore 1986, 132).

- Boulders, trees, benches, fallen trees, and sculptures are examples of stationary objects in natural settings

Water

Humans are drawn to water in various forms. It is intriguing, healing, and essential for human survival. This tangible element provides a living laboratory for play, imagination, education, and reflection. Ideally, children should have access to water in a variety of forms in the nature play network. Water provides a sensory experience through sound and touch. Due to its diverse recreational potential, water is attractive to humans. Water is also important for wildlife habitats. It is a source of life and has fundamental meaning for culture (Dee 2001, 76).

- Streams, ponds, waterfalls, step pools, and fountains are examples of water that can be implemented into a design for the nature play network

Open Spaces

Open spaces may vary in size and material. They create edges and a place for children to explore, play, imagine, and engage their senses. Edges are often used as an enclosing feature to define an open space, and are an important part of spatial design (Dee 2001, 35). This element creates a space for children to play games, and is also advantageous to parents or mentors when monitoring their play. The edges can be utilized for hide and seek. An open space is a tangible element that provides an opportunity for children to participate with others or simply be an onlooker to the activities and space.

- Examples of open space are lawn areas, patios, vacant lots, and fields

Topography

Topography can fundamentally alter an experience in a landscape, and is a powerful design tool (Dee 2001, 54). This element should have variety throughout the landscape. Creating mounds, depressions, slopes, and ridges illicit different sensory and physical experiences for children.

- Ravines, mounds, and walls are examples of topography useful for the nature play network

Vegetation

This tangible element can be utilized to define a space through enclosure, conceal and reveal, or open expanses. It is a fundamental medium for defining space within a landscape (Dee 2001, 62). Vegetation provides seasonal interest, opportunities to explore the cycles of nature, and also habitats for wildlife. It is also a medium for education and culture.

- The use of native and rare plant species coupled with variety in form, texture, and size are imperative to the nature play network. For example, groundcovers, lawn, woody and herbaceous shrubs, vines, understory trees, and canopy trees

Pathways

Pathways are essential in the nature play network. They are a primary structural component of designed landscapes when coupled with spaces. Pathways perform a crucial role in a design through facilitating the experience of a landscape (Dee 2001, 81). They provide links to other tangible or intangible elements, and also help create mystery. Variety in material, length, width, and form is important to enhance the cognitive and physical growth of children.

- Pathways can be constructed from gravel, mulch, stone, and groundcovers

Wild Places

This tangible element includes the areas within a landscape that are literally and figuratively off the beaten path so to speak. There are not formal pathways, entrances, and exits. Wild places are a frontier to children, uncharted territory where their imaginations can create and their cognitive and social skills grow. In Coyote's Guide to Reconnecting to Nature, wild places are a result of wandering and engaging the "body radar". This process is described as a practice that allows a child to feel which way they would like to go in wandering through a landscape (Young 2010, 316).

- Can be created by designing a nook enclosed by vegetation or hardscape, or placing features in a landscape off trail

Ephemeral

Ephemeral is a short-lived tangible element, which adds mystery and enhances the sensory experience of a landscape. This element can be utilized in the nature play network through education, culture, and cognitive and emotional development. Ephemeral is distinct from the other tangible elements in that it is a by-product of another tangible element, such as

water or vegetation. The use of bulbs and flowering plants enhances the ground plane (Dee 2001, 62).

- Implementing features for the treatment and management of runoff from rainfall, planting designs that incorporate seasonal flowering plants and a variety in understory & canopy trees to accentuate the factor of light

Intangible Elements

Intangible elements do not have a physical presence in the landscape, however they are created and shaped by the physical elements of the landscape. Intangible elements are most beneficial when they exhibit one or more of the following characteristics: (1) legibility, (2) variety, (3) mystery, (4) sensory, and (5) accessibility. Intangible elements must also be beneficial to children in some of the following ways, (1) cognitive, (2) social, (3) emotional, and (4) cultural. The elements are defined in the following section, and examples for each are given in the nature play matrix.

Sense of Place

This intangible element exists in a natural environment or in a designed space. The forms of a landscape create a narrative and express the connection between place and humans (Spirn 1998, 17). This element is the place in a landscape where a user can strongly experience the sense of place. Children feel the sense of place, and therefore can develop a bond to the natural environment. This element can also be a shared bond between others and culture, and a medium for mentoring, education, and cognitive and emotional development.

- Design elements are utilized to facilitate the sense of the place, such as hardscape or vegetation

Peter Pan Moment

This term is as a description of the spontaneous moment when the imagination and sense of wonder overtake a child. Edith Cobb's book, The Ecology of Imagination in Childhood, claims that imagination and sense of wonder are a prerogative of childhood (Cobb 1977, 27). This intangible element is more difficult to measure and incorporate into design guidelines. However, there are physical elements that can be implemented to create mystery and intrigue children. A Peter Pan Moment can be beneficial to a child's cognitive, social, and emotional development.

- Implementing secondary pathways, nooks, specimen plants, rope swings, structures, and large boulders

Secret Space

Secret space is defined as an area that creates a strong emotional bond for a child to that physical space. This is a normal stage in children development. They seek out and create a space in the natural world that is secret and private. This space may be shared with other children, however it is usually hidden from adults. This element provides cognitive, social, cultural, and emotional growth for a child. In Coyote's Guide To Connecting With Nature, Jon Young, Ellen Haas, and Evan McGowan explain methods, concepts, and applications for engaging children and connecting them to nature. Within their 'core routines', they describe the importance of developing a 'sit spot' (Young 2010, 292). This is an example of creating a secret space.

- Dense and enclosed vegetation, wooden or stone structures

Respite & Renewal

The natural environment provides emotionally and physical benefits to the health for children. Creating access to nature fosters connection. Children use nature and play as a means to work through their emotions. In Coyote's Guide to Reconnecting with Nature, the authors use one of their 'core routines' called 'expanding our senses' as a medium for engaging all five senses, which focuses on brain patterning. Through this 'core routine' a child can break habitual brain patterns and increase capacity for sensory information. This intangible element is beneficial to the cognitive and emotional development, and can be a medium for mentoring.

- Nooks off the main path with benches, fallen trees, or boulders

Narrative

The landscape tells a story, possibly many stories on any given day to a child. Landscapes serve as a setting or background for a narrative, and through their ever-changing stasis can become the narrative (Potteiger & Purinton 1998, 5-6). This intangible element can be achieved through a child's imagination, or by an adult mentoring and teaching a child. The design of a landscape can be implemented to achieve a specific narrative. Narrative is a medium for culture and education, and also cognitive, social, and emotional development.

- Highlighting specific elements in the design through spatial patterns or creating selective views or the use of signage

Views & Vistas

This element is created through physical elements in a landscape. Views and vistas provide mystery, legibility, and variety to a landscape. Providing views and vistas, especially one with vegetation has positive implications for health. Views and vistas engage the mind and

can reveal the extent of a landscape (Kaplan 1998, 99). They are an opportunity for education, and cognitive development. View and vistas may also be integral to the sense of the place.

- Vegetation and structures can be used to frame views, and topography can be utilized to accentuate the view

CHAPTER 6

Design Framework Applied to Southern Highlands Reserve

Design frameworks are essential tools for designers. They create a foundation for developing a design of a space based on specific concepts and goals. The design framework from the previous chapter will be applied to a specific site, Southern Highlands Reserve. This chapter describes the history of the site, reports inventory from the site, and applies the nature play network design framework in the form of matrices. The matrices are a graphic representation and evaluation of how each element achieves the characteristics and benefits of the nature play network, and also how the collective landscape operates as a network to achieve the characteristics and benefits. From these matrices, patterns emerge and inform recommendations.

Site History

Southern Highlands Reserve began about ten years ago on the top of Toxaway Mountain, North Carolina. Robert and Betty Balentine had made a conscious decision to cultivate a place and relationship with their children and nature. What began as a project to create a residential garden for them, friends, and family soon became an epic journey to plan, design, and build a private native plant display garden. There were many instrumental people involved in the creation of Southern Highlands Reserve: Robert & Betty Balentine, John Turner, John McCarley, Gary Smith, Jack Owen, Dick Bir, and Jesse Turner. Together the cast of

characters forged a vision and plans to create a great resource for the study of native plants in the Blue Ridge Mountains.

In the beginning, they were aware of the rare flora and fauna on the site, however by incorporating professionals in plant science, design, horticulture, and planning the magnitude of the unique ecosystems was identified. Robert and Betty have a deep connection to nature, especially forests. As a result of this connection and the land they had under conservation easement, Robert had the idea of creating an arboretum. Ultimately, they both wanted more than just trees and settled on creating a garden. John McCarley suggested a native plant garden, and the process began. Robert funded Jesse Turner and one of his fellow classmates to research gardens throughout the United States. In the summer of 2001, these students of landscape architecture at North Carolina State University visited several gardens and prepared field reports for the Southern Highlands Reserve.

By 2002, the ideas behind direction of the garden were well formed and a private operating foundation was created. Robert asked John Turner to bring in a professional designer to develop the master plan. Serendipity played a role as John Turner called Gary Smith on short notice to visit Southern Highlands Reserve. Gary had a cancellation in his schedule and a ticket to Asheville for the weekend John requested he visit.

Gary Smith, landscape architect, was brought in as the lead designer for the master plan. He conducted inventory and analysis of the site, and also interviewed all the members of the Balentine family. Above all the contributions Gary made to the development of Southern Highlands Reserve, the most important were three-fold: (1) orientation of the garden to North-

South, (2) collaborating closely with John Turner and Jack Owens, (3) created an order to the process and information.

The design and construction phases of the garden spanned six years. Between 2002 and 2008, large infrastructure was complete including a pond, trails, planting beds, the Chestnut Lodge, storage facilities, a waterfall, spillway, bridges, and the planting of the core park. Gary Smith worked closely with Jack Owens in the construction of entrances and other elements, which required stonework. John Turner supervised the entire construction process and was instrumental in the planting of the gardens.

After the opening celebration in May 2008, the Southern Highlands Reserve operated as a private garden and only invited guests or professionals in the related fields of biology, horticulture, geology, gardening, landscape architecture, and education to visit the garden. In 2011, Southern Highlands Reserve became open to the public for the first time allowing visitors to schedule tours on the third Tuesday of each month (May-October). An informal partnership with the award winning non-profit Muddy Sneakers was also created in 2011. Together the two organizations developed a summer camp for graduates of the Muddy Sneakers program and held a fundraiser at the Southern Highlands Reserve.

The concepts and passion behind the creation, development, construction, and existence of Southern Highlands Reserve reside in a very basic notion: connection to nature. The approach to the design and implementation of the gardens was grounded in interpreting the ecology of the land, and fostering a place where visitors could engage with the ecosystems of the Blue Ridge Mountains. Tangible and intangible elements of nature connection exist on this site, and furthermore the potential for greater connection with nature is explored in the nature play network matrices.

Inventory

The Southern Highlands Reserve is now a 120-acre native plant garden on top of Toxaway Mountain in North Carolina. The Core Park comprises about twenty acres on the site, and is divided into the following areas: (1) Woodland Glade, (2) Azalea Walk, (3) Wildflower Labyrinth & Mossy Bench area, (4) Chestnut Lodge, (5) Vaseyi Pond, and (6) View Site. The main trails connecting these areas are as follows; (1) Vaseyi Trail, (2) Yellowwood Trail, and (3) Winterberry Trail. The only area outside of the core park that will be included in the inventory and analysis of the design framework is the via ferrata and spray cliffs.

The design framework has been applied to each area of the core park, trails connecting these areas, and the via ferrata and spray cliffs. The inventory of each includes descriptions of the existing tangible and intangible elements that exist.

Woodland Glade

The Woodland Glade is the first area of the garden, and encompasses the Maple Entrance. The Maple Entrance is a unique experience in that the path and plantings frame an *Acer x freemanii*, or Freeman maple. *Acer x Freeman* is a cross between an *Acer rubrum* (red maple) and an *Acer saacharinum* (silver maple). The *freemanii* maple trunk is multi-stemmed, and the texture of the bark of is gnarled and sculptural, which adds to the variety of this entrance. The large stones for the path traverse a giant swath of Christmas ferns, and the entrance area is defined by a stand of rhododendron. This area offers minimal 'loose parts' and stationary objects. The Woodland Glade has only two planes of hierarchy, ground and canopy. The goal of this design decision was to create a cathedral like experience in this part of the garden. The ground plane is a mixture of *Phlox stolonifera*, *Tiarella*, and *Huecheras*. The existing trees were limbed up to

accentuate the ceiling of the canopy. These design decisions create a genus loci and a narrative. Striped bark maples (*Acer pensylvanicum*) and white fringe trees (*Chionanthus virginica*) were added throughout the Woodland Glade to frame the groundcovers. The circulation is open with a large path through the middle of the Woodland Glade, and is accented with several secondary paths for variety and interest. The Woodland Glade was purposely planted without any shrubs in order to capture a cathedral like experience through the canopy and groundcovers (See Appendix B: Diagram Woodland Glade Inventory).

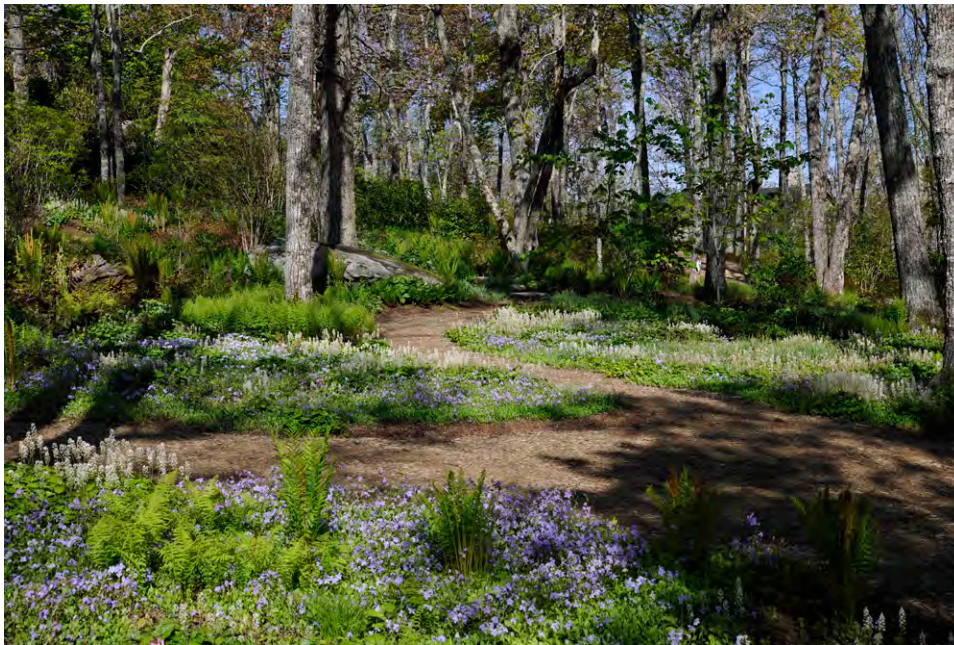


Figure 6.3 Woodland Glade



Figure 6.4 Woodland Glade

Azalea Walk

This area is the most recent addition to the Core Park at Southern Highlands Reserve. The area is home to an existing understory native plant ecosystem of *Clintonia* (Clinton's lily), *Trillium catesbaei* (bashful wakerobin), *Uvularia* (Bellwort), *Vaccinium cyanococcus* (blueberries), *Dennstaedtia punctilobula* (hayscented ferns), and *Rhododendron calandulaceum* (flame azalea), which creates an experience of a natural high elevation woodland garden. This area includes circulation through a secondary path that connects to the Woodland Glade primary path, and the addition of a collection of Gregory Bald azaleas (*Rhododendron cumberlandense* hybrid). The Gregory Bald collection has been added as a planting design that groups similar color azaleas together, and thus creates a heightened experience for the user. The Gregory Bald azaleas are planted in the following color sequence: warm reds to oranges and yellow, whites and pinks and on to cool reds. There is also a small spur path leading to a bench within

the Azalea Walk. The topography of this area is varied and at points higher than the majority of the Core Park. This area offers ephemeral experiences with vegetation, and has stationary objects, such as a bench and fallen tree that provide opportunities for respite and renewal (See Appendix B: Diagram Azalea Walk Inventory).



Figure 6.5 Azalea Walk



Figure 6.6 Azalea Walk

Wildflower Labyrinth and Mossy Bench Area

The Wildflower Labyrinth was built on an existing brownfield that was incorporated long before the idea of Southern Highlands Reserve was conceived. The brownfield was built when Toxaway Mountain was sited for twenty homes to be developed. Gary Smith utilized the grandfathered deed restrictions by designing a traditional seven-ring labyrinth with seasonal wildflower plantings to emulate the journey of life. The path is constructed of large stones, and is designed in a recursive pattern that offers time and space for meditation. The area is complimented by an enclosing planting of evergreen rhododendron, large standing boulders, and a lawn area, which creates a room within the garden and the spirit of the place. There are three entrances and exits to this area of the Core Park. The wildflowers used in the labyrinth planting create an ephemeral experience through spring and summer bloom periods, and completely engulf the stone path by the end of summer. The following is a list of the plants

used in the design: *Coreopsis* spp., *Baptisia* spp., *Echinacea* spp., *Rudbeckia lacinated*, *Asclepias tuberosa*, *Eupatorium purpureum*, and native grasses. In the center of the labyrinth, there is a stone bench for rest and reflection, which serves as a stationary object. The adjacent Mossy Bench Area is defined by an arched entrance crafted from a local artisan, a stonewall with a built-in bench, native forest plantings, and a flat lawn area. This area has open space and creates opportunities for respite and renewal to a child. From the lawn area, there are views of the Woodland Glade and Azalea Walk. The topography of the Wildflower Labyrinth and the Mossy Bench area are nestled into the natural slope of the land, which has an approximate elevation change of four to six feet from west to east (See Appendix B: Diagram Wildflower Labyrinth & Mossy Bench Area Inventory).



Figure 6.7 Wildflower Labyrinth



Figure 6.8 Wildflower Labyrinth



Figure 6.9 Mossy Bench Area Entrance



Figure 6.10 Mossy Bench Area

Chestnut Lodge and Roof Garden

The Chestnut Lodge is a multi-purpose building, which serves as the offices, classroom, meeting facility, guest quarters, and maintenance storage area for the staff and visitors of Southern Highlands Reserve. Gary Smith designed the roof garden, an intensive green roof, so that the natural topography of the woodland site connects to the Chestnut Lodge and the footprint of the building is concealed. The roof garden displays many specimen native plants and several plants transplanted from the natural areas of the site. The following is a list of the plants: *Chionanthus virginicus* (fringe tree), *Cornus alternifolia* (Pagoda dogwood), *Rhododendron cumberlandense* hybrid (Gregory Bald azalea), *Rhododendron maximum*, *Kalmia latifolia* (mountain laurel), *Galax* spp., and several varieties of ferns, lichens, and moss.

The structure to support this design is a traditional construction method of belt and suspenders coupled with a layer of Hydrotech plastic lining to endure proper drainage. The planting medium is composed of a lightweight aggregate with only twenty percent organic matter, and a depth of eight to twelve inches. The patio is irregular in design and creates two separate rooms. One serves as the main entrance to the lodge, and a gathering space. The view from this vantage point illuminates several paths varying in size, and the pervious motor court that compliments the design intent of the roof garden. The hardscape of stone on the roof garden connects the adjacent room to the main entrance. Through the collective use of seat walls, Rhododendron plantings, outdoor furniture, and soapstone the size of a car this room is the primary inception of each tour of the gardens. There are several stationary objects in this area. The soapstone adds another layer of detail through Appalachian culture and history to the area and the Southern Highlands Reserve. A local Cherokee artist, Joel Queen, carved the Cherokee myth about the how their ancestors first acquired fire. The interior of the lodge continues to reflect the native Appalachian culture and history by displaying pictures, artifacts, books, and also in the use of wormy Chestnut for the walls and ceilings. The lower level of the lodge is accented by a small garden that consists of a lawn area, stone steps, native perennials and woody shrubs, and a large stone area for gathering and cooking (See Appendix B: Chestnut Lodge & Roof Garden Diagram Inventory).



Figure 6.11 Chestnut Lodge

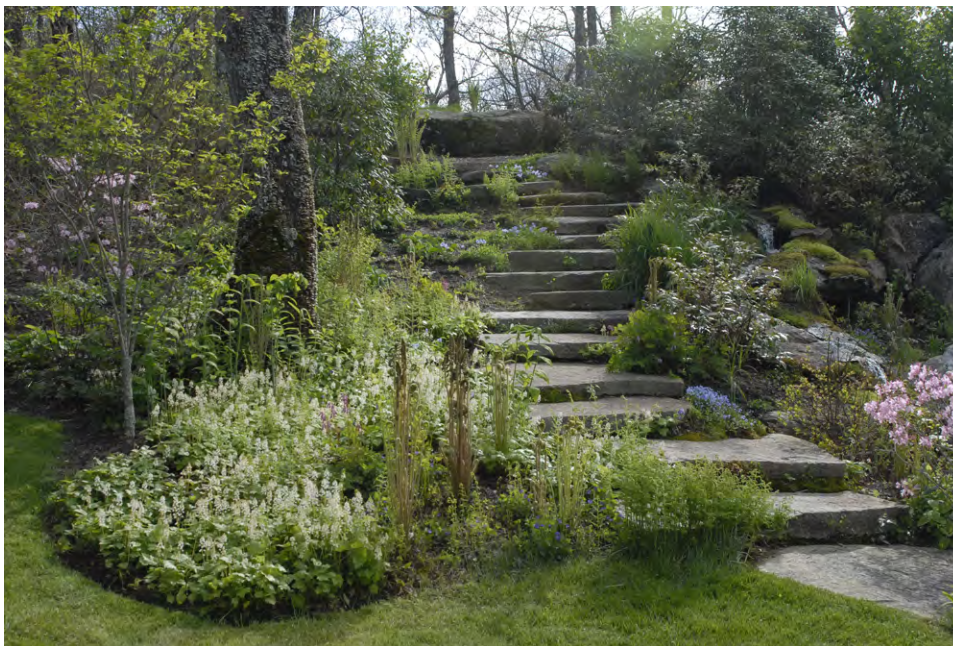


Figure 6.12 Steps from Chestnut Lodge to Roof Garden



Figure 6.13 Roof Garden



Figure 6.14 Soapstone Sculpture on Roof Garden

Vaseyi Pond

The pond was the first large infrastructure built at the Core Park. It includes several large stones cantilevering over the water, paths, a waterfall, and one sitting area. The topography and vegetation were incorporated into the design in order to conceal the pond until a specific point from paths. The plantings in this area consist of the following: *Rhododendron*, *Viburnum*, Vaseyi azalea, *Phlox*, *Tiarella*, *Chelone glabra*, *Rudebekia lacinata*, *Veronicastrum virginicum*, and *Eupatorium*. A small stream enters the south of the pond and creates a bog area that is home to native carnivorous plants, *Sarracenia* spp. This area offers 'loose parts', stationary objects, and wild places for children. The pond area is designed as a place of peaceful respite and reflection. However, the element of water is a magnet for life in any garden. The pond has increased the biodiversity of the Core Park providing a home for amphibians, aves, and mammals, and thus creates a narrative and *genus loci*. The most spectacular view from the Vaseyi Pond is north toward the View Site (See Appendix B: Vaseyi Pond & View Site Diagram Inventor).



Figure 6.15 Vaseyi Pond



Figure 6.16 Vaseyi Pond

View Site

The View Site is a large rolling lawn area complimented by rock walls on the perimeter, which creates an open space with edges. There are wild places nestled into the vegetation that enclose this space, and create opportunities for Peter Pan Moments. The view is a vast and sweeping north frame of the southern Appalachian Mountains. It includes the forest known as Panther Town, Looking Glass Rock in Pisgah National Forest, the Blue Ridge Parkway, and Cold Mountain. This area is also designed to mesh with the topography of the land. As the topography decreases with the slope, three distinct areas are nestled by plantings, large stones, paths, and lawn areas. The bottom tier of this design is a massive stone gathering area with a fire pit built into the ground. Stationary objects and 'loose parts' are scattered throughout this area. There are native plantings of Rhododendron, azaleas, wildflowers, ferns, and grasses that compliment the stonework. The View Site creates a sense of exposure that is unparalleled in the Core Park (See Appendix B: Vaseyi Pond & View Site Diagram Inventory).



Figure 6.17 View Site & Vaseyi Pond



Figure 6.18 View Site

Vaseyi Trail

Vaseyi Trail is an alternative path that leads to the southern edge of the Vaseyi Pond. It crosses over a stream and step pools through two locust bridges built by local artisans. The ground is

covered in *Galax* spp., and the understory is a massive natural occurring planting of Vaseyi azaleas. The topography, vegetation, and water create wild places and opportunities for ephemeral experiences. This stand of Vaseyi azaleas are unique in that there are only about a dozen of them found in the world today, and therefore create a narrative and spirit of the place. The design of this trail exudes mystery through the use concealing and revealing as it meanders down the slope of the site (See Appendix B: Vaseyi Trail Diagram Inventory).

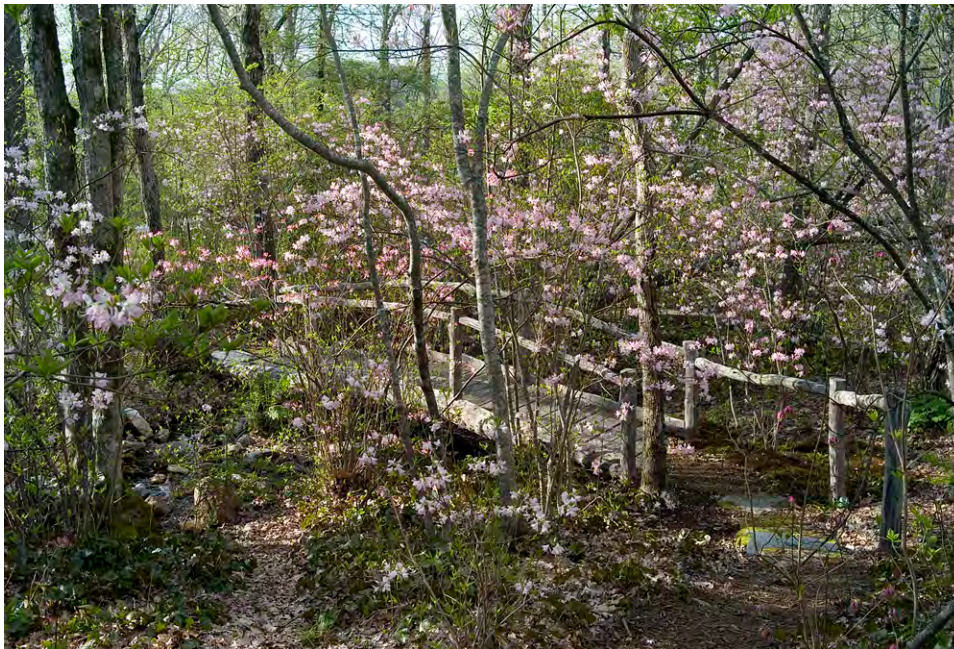


Figure 6.19 Vaseyi Trail & Bridge

Yellowwood Trail

Yellowwood Trail connects the View Site to the Chestnut Lodge. It begins at a formal arched entrance and quickly becomes emerged in a forest of *Kalmia latifolia*. Within a sort distance from the exposure of the view site, the visitor is completely hidden and wild places exist in every direction. The path is narrow and traverses another stream on a locust bridge, which provides stationary objects and an ephemeral experience. The path opens up as the vegetation

recedes with the slope of the topography increasing. A series of platforms and steps made from locust emulate the form of a rattlesnake as the path emerges to a gravel area that hosts Jack's Barn. The barn is a storage area for equipment. The trail continues up stone steps accented by a moss and native orchid planting, and ends at the lower level parking area of the Chestnut Lodge (See Appendix B: Yellowwood Trail Diagram Inventory).



Figure 6.20 Yellowwood Trail

Winterberry Trail

Winterberry Trail is a wide path consisting of small gravel, and exists on the outer edge of the Core Park. It connects the Chestnut Lodge to the Wildflower Labyrinth, Azalea Walk, and the Woodland Glade. The plantings along the trail are mostly naturally occurring and complimented with native spruce and fir trees.

There is a natural area to the west of the trail that invites exploration for the discovery of wild places (See Appendix B: Winterberry Trail Diagram Inventory).



Figure 6.21 Winterberry Trail

Via Ferrata & Spray Cliffs

Although this area is outside of the Core Park, it has been included due its the ecological and cultural importance. It comprises about one hundred acres on a steep southeast-facing slope, has an elevation change of about one thousand feet, and is the upper most face of the Blue Ridge escarpment seen from the piedmont of South Carolina. This area is managed for

preservation purposes, and therefore visitor use is scheduled and structured by staff at the Southern Highlands Reserve. The spray cliff community has a strenuous path, three waterfalls, grottoes, and a climbing element called the Via Ferrata. These landscape features create a *genus loci* and narrative. This area creates an opportunity for respite and renewal, and Peter Pan Moments. The three waterfalls are as follows: (1) Christmas Falls, (2) Eden Falls, and (3) Chaos Falls. Each is home to rare native plants such as, *Vitarria appalachiana* (Appalachian shoestring fern), *Parnissia glauca* (grass of Parnassus), granite dome bluet, liverwort, moss, and alumroot.

The topography and terrain of this area are strenuous, and the added element of the Via Ferrata enhances the experience through an exposed six hundred feet horizontal rock-climbing traverse (See Appendix B: Via Ferrata & Spray Cliffs Diagram Inventory).



Figure 6.22 Hike to the Spray Cliffs



Figure 6.23 Via Ferrata

CHAPTER 7

Conclusion

The critical issues facing children's ability to connect with nature are increasing as access to green space is decreasing and the rapid rise of technology continues to lure them indoors. The current generation has a very different experience with the landscape than the generation raising them. Designers and environmental planners are inherently synthesizers of information and agents of change, and these issues fall into their professional realm for solutions. However, the solutions to the issues must be a product from a multi-disciplinary approach. The research from this thesis has illustrated how a myriad of disciplines are engaged in addressing these issues.

Humans' relationship with nature directly affects the future. Play directly affects the development of a child. Nature play and nature connection directly affects the development of a child. The meaning of landscape directly affects a human's relationship with nature. Fostering a connection to nature for children through the design process holds a crucial key to the future of humans.

The design framework included a literature review of humans' relationship to nature, the history and significance of play, and the meaning of landscape. From this research, the nature play network was created, characteristics and benefits were identified, and tangible and intangible elements were developed for the nature play network. The nature play network was applied to a site in the southern Appalachian Mountains, Southern Highland Reserve. An

inventory and analysis of the site was conducted using the design framework of the nature play network and matrices. Recommendations were made based on the patterns that emerged from the matrices, and through analyzing the overall network of the site with the design framework. The purpose of these recommendations is to enhance the cognitive, social, emotional, cultural, and educational benefits for children experiencing the site. If implemented, the recommendations would increase the appeal and the positive impact of the site to children, and quite possibly many adults, while preserving and respecting the numerous other functions and users of the site.

The concluding patterns from the nature play network have illustrated that in order to enhance a site that connects children to nature and engages them in nature play, designers and environmental planners must identify, create, and evaluate the tangible and intangible elements of an area within the context of the larger landscape (network). These elements are not a prescription for creating nature play, nor are they intended to be placed in a landscape without evaluating the entire network holistically. Nature play network elements should be added to an existing landscape only if they enhance the overall network and without degrading the existing conditions.

Design concepts coupled with programming these elements will help foster nature play for children in a natural environment. This research contributes the mission of Southern Highlands Reserve, which advocates for native plants in the region through education, restoration, and research. The Southern Highlands Reserve collaborates with organizations focused on reconnecting children to nature. This research can inform future collaborations. This research is the first step in the process of evaluating the potential for Southern Highlands

Reserve to connect children to nature. Future research could include further analysis of nature play on the site, and the role in which the organization desires to take on in engaging with other organizations in relation to nature play.

A limitation of the design framework is the time and ability to evaluate this site during all four seasons would provide more insight into the dynamics of the nature play network. Another limitation lies in the fact that the site, Southern Highlands Reserve, is a private garden, and therefore access for the public is restricted to the first Tuesday of each month during March through October. Also, having more time to engage and observe children on the site would have been beneficial in evaluating the intangible elements of the nature play network. Collaboration with school groups or organizations working with children would be one way to monitor the success of the design framework on a site.

The nature play network is a tool for the designer, however these issues must also be addressed by society and culture. The interconnection of nature and humans does not pause or stop as a child leaves a garden or vacant lot. This relationship permeates all structures and beings. Johann Wolfgang Von Goethe eloquently summarizes this connection, “In nature we never see anything isolated, but everything in connection with something else which is before it, beside it, under it and over it.” (Klostermann-Ketels 2011, 112) Therefore, humans have a responsibility to nurture and grow the connection of children to nature with great integrity.

REFERENCES

- Francis, Mark Jr. and Hester, Randolph T., editors, The Meaning of Gardens. Cambridge, Massachusetts: MIT Press, 1990.
- Kahn, Peter H. and Kellert, Stephen R., editors, Children and Nature. Cambridge, Massachusetts and London, England: Massachusetts Institute of Technology, 2002.
- Center for Disease and Prevention (CDC), "Childhood Obesity Facts", accessed February 9, 2012, <http://www.cdc.gov/healthyyouth/obesity/facts.htm>.
- Cobb, Edith. The Ecology of Imagination in Childhood. New York: Columbia University Press, 1977.
- Davis, Donald E. Where Are the Mountains. Athens, Georgia: The University of Georgia Press, 2000.
- Dee, Catherine. Form and Fabric in Landscape Architecture: A Visual Introduction. London, England: Spoon Press, 2001.
- Driskell, David, editor. Universal Access to Outdoor Recreation: A Design Guide. Berkeley, CA: PLAE, Inc., 1993.
- Frost, Joe L., Sue C. Wortham, and Stuart Reifel. Play and Child Development. Upper Saddle River, New Jersey: Prentice-Hall, 2001.
- Gardner, Howard. Intelligence Reframed. New York: Basic Books, 1999.
- Kaplan, Rachel, Kaplan, Stephen, and Ryan, Robert L. With People in Mind: Design and Management of Everyday Nature. Washington, D.C.: Island Press, 1998.

Klostermann-Ketels, Joan. Humani Trees: Exploring Human Nature through the Spirit of Trees.

Scotland, UK: Findhorn Press, 2011.

Kuo, Frances E. (Ming). "Parks and Other Green Environments: Essential Components of a Healthy Human Habitat." 2010.

Louv, Richard. Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder.

Chapel Hill, North Carolina: Algonquin Books of Chapel Hill, 2005.

Marx, Leo. The Machine in the Garden: Technology and the Pastoral Ideal in America. Vol.

Oxford University Press, Oxford, London, 1964.

Mooney, James. Cherokee History, Myths and Sacred Formulas. Cherokee, North Carolina:

Cherokee Publications, 2006.

Moore, Robin C. Childhood's Domain. London, England: Croom Helm, 1986.

Potteiger, Matthew and Purinton, Jamie. Landscape Narratives. New York: John Wiley & Sons,

INC, 1998.

Spirn, Anne W. The Language of Landscape. New Haven and London: Yale University Press,

1998.

Wilson, Edward O. Biophilia. Cambridge, Massachusetts, and London, England: Harvard

University Press, 1984.

Wilson, Edward O. The Biophilia Hypothesis. Edited by Edward O. Wilson and Stephen R. Kellert.

Washington, D.C., Island Press, 1993.

Young, Haas, McGowan. Coyote's Guide to Connecting with Nature. Shelton, Washington:

Owlink Media Corporation, 2010.

DESIGN ELEMENTS	CHARACTERISTICS					BENEFITS					SUMMARY	DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS	
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL				
AZALEA WALK														
LOOSE PARTS				■		■	■	■			■	■	VEGETATION	ROCKS OR STICKS OR SEEDHEADS OR LEAVES
STATIONARY OBJECTS	■		■	■		■	■	■		■	■	■	BENCH, FALLEN TREES	BOUDLERS OR SCULPTURE
WATER												■		NOT RECOMENDED-ADDRESSED IN ANOTHER AREA
OPEN SPACES			■	■	■	■	■	■			■	■	SMALL AREA OFF MAIN PATH	NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY	■	■		■	■	■	■	■	■		■	■	GENTLE STROLL WITH VARIETY	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION	■	■	■	■	■	■		■		■	■	■	LAYERED WOODLAND AREA	NTO RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS	■			■		■						■	MAIN PATH COMPRISED OF MULCH FOR MATERIAL	SECONDARY PATHS OR VARIETY IN MATERIAL
WILD PLACES	■		■	■	■	■	■	■		■	■	■	AREAS OFF THE PATH OFFER WILD WOODLAND EXPERIENCES	NOOK CREATED BY BOULDERS OR FALLEN TREES
EPHEMERAL	■	■	■	■	■	■		■		■	■	■	VEGETATION RESPONDS TO CHANGE IN SEASONS	NOT RECOMMENDED-WOULD DEGRADE AREA
SENSE OF PLACE	■											■	PLANTINGS NEED TIME TO MATURE	NOT RECOMMENDED-WOULD DEGRADE AREA
PETER PAN MOMENT				■		■	■	■		■	■	■	ANIMAL TRAILS OFFER OPPORTUNTIES	SCULPTURE OR UNIQUE PLANT SPECIES OFF TRAIL
SECRET SPACE												■		NOT RECOMMENDED-WOULD DEGRADE AREA
RESPITE & RENEWAL	■	■		■	■	■		■		■	■	■	SMALL AREA WITH BENCH OFF MAIN PATH	BENCHES OR SMALL AREA WITH SEATWALL
NARRATIVE	■			■	■	■				■	■	■	NARRATIVE WILL DEVELOP WITH VEGETATION GROWTH	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS												■		NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY	■	■	■	■	■	■	■	■	■	■	■	■		

Appendix A 88

DESIGN ELEMENTS YELLOWWOOD TRAIL		CHARACTERISTICS					BENEFITS					SUMMARY	DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS		
		LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL					
DESIGN ELEMENTS	LOOSE PARTS				■		■	-	■	-	■		■	■	VEGETATION, ROCKS, & STICKS	NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
	STATIONARY OBJECTS	■	-	■		■	■	-	■	-	■		■	■	BRIDGE, FALLEN TREES, & PLATFORMS	NOT RECOMMENDED-WOULD DEGRADE AREA
	WATER	■			■		■	-	■	-	■		■	■	SPILLWAY FROM POND, STEP POOLS	NOT RECOMMENDED-WOULD DEGRADE AREA
	OPEN SPACES			■	-	■	■	-	■	-	■		■	■	PLATFORMS & GRAVEL AREA NEAR BARN	NOT RECOMMENDED-WOULD DEGRADE AREA
	TOPOGRAPHY	■	-	■		■	■						■	■	GENTLE STROLL INTO STEEP CLIMB	NOT RECOMMENDED-WOULD DEGRADE AREA
	VEGETATION	■			■	-	■		■		■		■	■	LAYERED WOODLAND AREA WITH SENSE OF ENCLOSURE	NOT RECOMMENDED-WOULD DEGRADE AREA
	PATHWAYS	■	-	■		■	■	-	■		■		■	■	VARIETY IN MATERIAL & WIDTH	NOT RECOMMENDED-WOULD DEGRADE AREA
	WILD PLACES	■		■	-	■	■	-	■	-	■		■	■	ANIMAL TRAILS OFFER OPPORTUNITIES	SECONDARY TRAILS & WOODEN STRUCTURES OFF TRAIL
	EPHEMERAL	■	-	■	-	■	-	■		■		■		■	VEGETATION & WATER RESPOND TO CHANGE IN SEASONS	NOT RECOMMENDED-WOULD DEGRADE AREA
	SENSE OF PLACE	■	-	■		■	-	■		■			■	■	MEANDERING TRAIL THROUGH DENSE UNDERSTORY & WATER	NOT RECOMMENDED-WOULD DEGRADE AREA
	PETER PAN MOMENT	■	-	■	-	■		■	-	■	-	■		■	WATER, BRIDGES, & FALLEN TREES ARE OPPORTUNITIES	SECONDARY TRAILS OR WOODEN STRUCTURES OFF TRAIL
	SECRET SPACE	■		■	-	■		■	-	■	-	■		■	VEGETATION & BRIDGES ARE OPPORTUNITIES	NOT RECOMMENDED-WOULD DEGRADE AREA
	RESPIRE & RENEWAL	■	-	■		■		■		■	-	■	-	■	SMALL AREA WITH BENCH OFF MAIN PATH	NOT RECOMMENDED-WOULD DEGRADE AREA
	NARRATIVE	■			■		■	-	■	-	■	-	■	■	TRAIL NESTLED INTO TOPOGRAPHY	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS													■		NOT RECOMENDED-ADDRESSED IN ANOTHER AREA	
SUMMARY		■	■	■	■	■	■	■	■	■	■	■	■			

Appendix A 89

DESIGN ELEMENTS WINTERBERRY TRAIL	CHARACTERISTICS					BENEFITS					SUMMARY	DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS	
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL				
LOOSE PARTS				■		■	-	■	-	■		□	ROCKS	NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
STATIONARY OBJECTS												□		BENCHES OR BOULDERS ON EDGE OF TRAIL
WATER												□		NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
OPEN SPACES												□		NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY	■					■						□	VARIES GENTLY	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION	■	■		■		■		■		■	-	■	DENSE WOODLAND AREA OFF TRAIL	NATIVE PLANTINGS FOR FIVE SENSES OR MEDICINAL
PATHWAYS	■			■		■		■		■	-	■	MEANDERS THROUGH EASTERN SIDE OF CORE PARK	SECONDARY PATHS THROUGH WOODLAND AREA
WILD PLACES	■		■	■		■	-	■	-	■	-	■	ANIMALS TRAILS OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA
EPHEMERAL	■			■	■	■		■		■	-	■	VEGETATION RESPONDS TO CHANGE IN SEASONS	AREAS OFF THE PATH OFFER WILD WOODLAND EXPERIENCES
SENSE OF PLACE												□		DESIGN SENSE OF ARRIVAL AT ENTRANCE OR EXIT
PETER PAN MOMENT	■			■	■	■		■				■	LARGE STONES OFF TRAIL	SCULPTURE OR WOODEN STRUCTURES IN WOODLAND AREA
SECRET SPACE	■	■	■	■		■	-	■	-	■	-	■	2 AREAS WITHIN THE WOODLAND OFF TRAIL	INCREASE EVERGREEN VEGETATION OR ADD BOULDERS
RESPITE & RENEWAL	■		■	■	■	■	-	■	-	■		■	STROLL ON TRAIL OFFERS CONNECTION TO NATURE	CREATE NOOKS OFF TRAIL WITH SEATING OR SECONDARY PATH
NARRATIVE	■			■		■		■				■	TRAIL IS A CONNECTOR FOR MANY AREAS OF THE CORE PARK	WAYFINDING NOTCHED IN A DECLINING TREE OR SCULPTURE
VIEWS & VISTAS												□		NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY	■	□	□	■	□	■	□	■	□	□				

Appendix A 90

DESIGN ELEMENTS	CHARACTERISTICS					BENEFITS					DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL		
WILDFLOWER LABYRINTH												
LOOSE PARTS											SEEDPODS & SEEDHEADS	NOT RECOMMENDED-WOULD DEGRADE AREA
STATIONARY OBJECTS											BENCH, UPRIGHT BOULDERS	NOT RECOMMENDED-WOULD DEGRADE AREA
WATER												NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
OPEN SPACES											CIRCULAR LAWN AREA ENCLOSES LABYRINTH	NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY											MOSTLY LEVEL WITH GENTILE SLOPE ON EAST END	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION											EVERGREEN SHRUBS ENCLOSE WILDFLOWER PLANTINGS	NOT RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS											STONES USED FOR TRADITIONAL 7 RING LABYRINTH	NOT RECOMMENDED-WOULD DEGRADE AREA
WILD PLACES												NOT RECOMMENDED-WOULD DEGRADE AREA
EPHEMERAL											VEGETATION RESPONDS TO CHANGE IN SEASONSS	VEGETATION RESPONDS TO CHANGE IN SEASONS
SENSE OF PLACE											AREA FOR REFLECTION, MEDITATION, & EXPLORATION	VEGETATION RESPONDS TO CHANGE IN SEASONS
PETER PAN MOMENT											LABYRIINTH DURING SUMMER & FALL	IMPLEMENT ART & SCULPTURE IN LAWN AREA
SECRET SPACE												NOT RECOMMENDED-WOULD DEGRADE AREA
RESPITE & RENEWAL											LABYRINTH PATH AND BENCH OFFER PASSIVE RECREATION	NOT RECOMMENDED-WOULD DEGRADE AREA
NARRATIVE											LABYRINTH & VEGETATION ILLUSTRATE THE UPS & DOWNS OF LIFE	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS												NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY												

DESIGN ELEMENTS VIEW SITE AREA	CHARACTERISTICS					BENEFITS					SUMMARY	DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL			
LOOSE PARTS		■		■		■	■	■			■	VEGETATION	NOT RECOMMENDED-WOULD DEGRADE AREA
STATIONARY OBJECTS	■	■		■	■	■	■	■			■	BOULDERS, BENCHES, & WALLS	BENCH, FALLEN TREE
WATER											□		NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
OPEN SPACES	■	■		■	■	■	■	■	■	■	■	TWO LAWN AREAS & LARGE STONE FIRE PIT	NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY	■	■		■		■	■				■	3 ELEVATION CHANGES TO THE FIRE PIT AREA	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION	■	■		■	■	■				■	■	PLANTINGS ACCENT EDGES OF LAWN AND STATIONARY OBJECTS	NOT RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS	■					■	■				□	VARIETY IN MATERIAL & WIDTH	NOT RECOMMENDED-WOULD DEGRADE AREA
WILD PLACES	■		■	■		■	■	■		■	■	ACCESS TO YELLOWWOOD TRAIL	NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
EPHEMERAL	■			■	■	■	■			■	■	VEGETATION RESPONDS TO CHANGE IN SEASONS	AREAS OFF THE PATH OFFER WILD WOODLAND EXPERIENCES
SENSE OF PLACE	■			■	■	■		■	■	■	■	VIEWS OF THE SOUTHERN APPALACHIAN MOUNTAINS	NOT RECOMMENDED-WOULD DEGRADE AREA
PETER PAN MOMENT	■	■	■	■	■	■	■	■			■	TOPOGRAPHY & VEGETATION OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA
SECRET SPACE				■	■	■	■	■			■	VEGETATION & BOULDERS OFFER OPPORTUTNIES	NOT RECOMMENDED-WOULD DEGRADE AREA
RESPITE & RENEWAL	■	■		■	■	■		■		■	■	LAWN AREAS WITH BENCHES & SEATING FROM BOULDERS	NOT RECOMMENDED-WOULD DEGRADE AREA
NARRATIVE	■		■	■	■	■	■	■	■	■	■	VIEWS OF THE SOUTHERN APPALACHIAN MOUNTAINS	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS	■			■	■	■		■	■	■	■	VIEWS OF THE SOUTHERN APPALACHIAN MOUNTAINS	NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY	■	■	□	■	■	■	■	■	□	■	■		

Appendix A 92

DESIGN ELEMENTS VIA FERRATA & SPRAY CLIFFS	CHARACTERISTICS					BENEFITS					DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL		
LOOSE PARTS	<div></div>			<div></div>		<div></div>	<div></div>	<div></div>			VEGETATION, AQUATIC LIFE, ROCKS, & STICKS	NOT RECOMMENDED-WOULD DEGRADE AREA
STATIONARY OBJECTS	<div></div>	<div></div>		<div></div>		<div></div>	<div></div>	<div></div>			BOULDERS, FALLEN TREES, BENCHES, & PLATFORMS	NOT RECOMMENDED-WOULD DEGRADE AREA
WATER	<div></div>	<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>		<div></div>	WATERFALLS, SPRAY CLIFFS, SHALLOW POOLS, & STREAMS	NOT RECOMMENDED-WOULD DEGRADE AREA
OPEN SPACES				<div></div>	<div></div>	<div></div>	<div></div>				PLATFORMS ON STAIRS & CART PARKING AREA	NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY	<div></div>	<div></div>		<div></div>		<div></div>					STRENUOUS & VARIES GREATLY	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION		<div></div>		<div></div>		<div></div>		<div></div>		<div></div>	DENSE WOODLAND AREA & RARE SPECIMEN NATIVES	NOT RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS		<div></div>	<div></div>	<div></div>		<div></div>	<div></div>			<div></div>	VARIETY IN MATERIAL & WIDTH, OPTIONAL CLIMBING ROUTE	NOT RECOMMENDED-WOULD DEGRADE AREA
WILD PLACES		<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>		<div></div>	ANIMALS TRAILS & SPRAY CLIFFS' GROTTOs	NOT RECOMMENDED-WOULD DEGRADE AREA
EPHEMERAL	<div></div>	<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>		<div></div>	VEGETATION & WATER RESPOND TO CHANGE IN SEASONS	NOT RECOMMENDED-WOULD DEGRADE AREA
SENSE OF PLACE		<div></div>	<div></div>	<div></div>		<div></div>		<div></div>	<div></div>	<div></div>	SPRAY CLIFF AREAS EXUDE AN ANCIENT TIME PERIOD	NOT RECOMMENDED-WOULD DEGRADE AREA
PETER PAN MOMENT		<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>		<div></div>	ANIMAL TRAILS, BOULDERS, WATERFALLS, & SHALLOW POOLS	NOT RECOMMENDED-WOULD DEGRADE AREA
SECRET SPACE	<div></div>		<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>			GROTTOs & VEGETATION OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA
RESPITE & RENEWAL	<div></div>	<div></div>	<div></div>	<div></div>		<div></div>		<div></div>			WATER, GROTTOs, & BOULDERS OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA
NARRATIVE	<div></div>	<div></div>	<div></div>	<div></div>		<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	SPRAY CLIFF COMMUNITIES & TOPOGRAPHY CREATE A STORY	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS			<div></div>	<div></div>		<div></div>		<div></div>			NOT AVAILABLE WITHOUT ACSENDING THE VIA FERRATA	NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>		

DESIGN ELEMENTS VASEYI TRAIL	CHARACTERISTICS					BENEFITS					DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL		
LOOSE PARTS											VEGETATION, AQUATIC LIFE	ROCKS OR STICKS OR VEGETATION WITH SEEDHEADS
STATIONARY OBJECTS											BENCH & BRIDGES	NOT RECOMMENDED-WOULD DEGRADE AREA
WATER											STREAM, BOG, & STEP POOLS	NOT RECOMMENDED-WOULD DEGRADE AREA
OPEN SPACES												NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY											VARIES THROUGHOUT TRAIL & GRADUALLY DESCENDS TO POND	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION											DENSE WOODLAND AREA ACCENTED WITH AZALEA COLLECTION	NOT RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS											PRIMARILY MULCH & SINGLE TRACK	SECONDARY PATHS OR VARIETY IN MATERIAL
WILD PLACES											ANIMAL TRAILS & WATER FOR EXPLORATION	NOT RECOMMENDED-WOULD DEGRADE AREA
EPHEMERAL											VEGETATION & WATER RESPOND TO CHANGE IN SEASONS	NOT RECOMMENDED-WOULD DEGRADE AREA
SENSE OF PLACE											COLLECTION OF AZALEAS ARE RARE	NOT RECOMMENDED-WOULD DEGRADE AREA
PETER PAN MOMENT											BRIDGES, ANIMALS TRAILS, & WATER OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA
SECRET SPACE											DENSE VEGETATION OFFERS POTENTIAL OPPORTUNTIES	CREATE NOOKS WITH EVERGREEN VEGETATION OFF TRAIL
RESPITE & RENEWAL											TRAIL MENADERS WITH WATER AND TOPOGRAPHY	NOT RECOMMENDED-WOULD DEGRADE AREA
NARRATIVE											SENSE OF ENCLOSURE CULMINATES AT POND	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS											LIMITED DUE TO VEGETATION UNTIL TRAIL INTERSECTS POND	NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY												

DESIGN ELEMENTS VASEYI POND AREA	CHARACTERISTICS					BENEFITS					DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL		
LOOSE PARTS	■	■	■	■		■	■	■		■	ROCKS, STICKS, & AQUATIC LIFE	NOT RECOMMENDED-WOULD DEGRADE AREA
STATIONARY OBJECTS	■	■	■	■	■	■	■	■	■	■	BOULDERS, BENCHES, & LARGE STONES CANTILEVER THE POND	NOT RECOMMENDED-WOULD DEGRADE AREA
WATER	■	■	■	■		■	■	■		■	POND, WATERFALL, SPILLWAY, & BOG	NOT RECOMMENDED-WOULD DEGRADE AREA
OPEN SPACES	■			■		■	■	■			TWO LAWN AREAS	NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY	■	■		■		■	■				STEEP NEAR WATERFALL & GENTLE ROLLING AROUND POND	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION	■	■	■	■	■	■	■	■		■	DENSE LAYERING ON EDGES OF LAWN AREAS	NOT RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS	■	■		■		■	■				VARIETY IN MATERIAL, WIDTH, & GRADE	NOT RECOMMENDED-WOULD DEGRADE AREA
WILD PLACES	■	■	■	■		■	■	■		■	VARIETY IN VEGETATION & WATER OFFER OPPORTUNITIES	NOT RECOMMENDED-WOULD DEGRADE AREA
EPHEMERAL	■	■	■	■	■	■		■		■	VEGETATION & WATER RESPOND TO CHANGE IN SEASONS	NOT RECOMMENDED-WOULD DEGRADE AREA
SENSE OF PLACE	■			■	■	■		■			WATER CAPTURES AND CREATES THE SENSE OF PLACE	NOT RECOMMENDED-WOULD DEGRADE AREA
PETER PAN MOMENT	■	■	■	■		■	■	■		■	ANIMALS TRAILS & SECONDARY TRAILS	NOT RECOMMENDED-WOULD DEGRADE AREA
SECRET SPACE	■			■		■	■	■			VEGETATION & TOPOGRAPHY OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA
RESPIRE & RENEWAL	■	■	■	■	■	■		■			WATER, BENCHES, & LAWN AREAS OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA
NARRATIVE	■	■	■	■	■	■	■	■	■	■	WATER & VEGETATION CREATE MULTIPLE HABITATS	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS	■			■	■	■		■	■	■	VIEWS OF THE SOUTHERN APPALACHIAN MOUNTAINS	NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY	■	■	■	■	■	■	■	■	■	■	Appendix A 95	

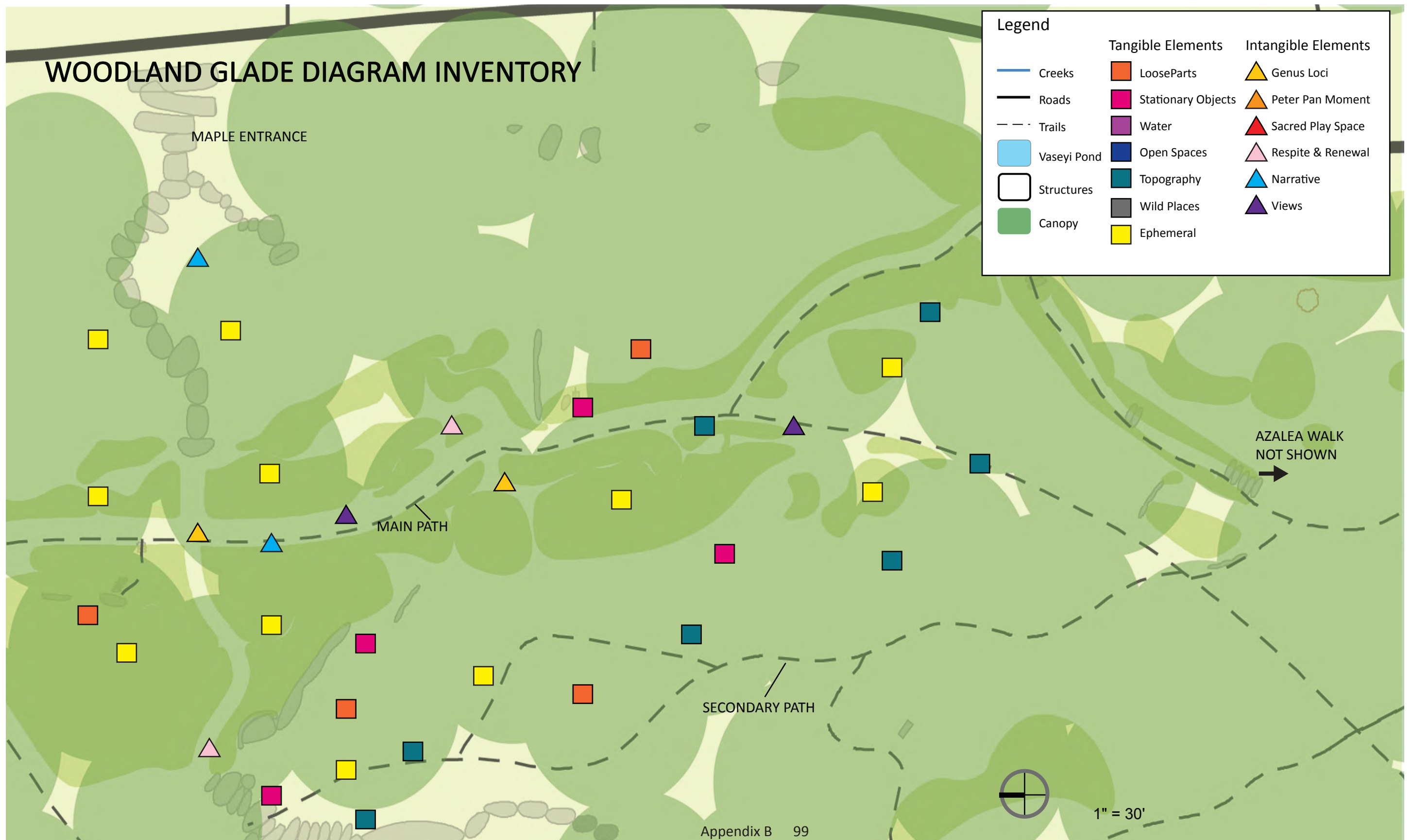
DESIGN ELEMENTS	CHARACTERISTICS					BENEFITS					SUMMARY	DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS	
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL				
MOSSY BENCH AREA														
LOOSE PARTS				■		■	■	■			■	VEGETATION	NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA	
STATIONARY OBJECTS	■			■	■	■	■		■	■	■	BENCH, FALLEN TREE	SCULPTURE OR BOULDERS	
WATER											■		NOT RECOMMENDED-WOULD DEGRADE AREA	
OPEN SPACES	■			■	■	■	■	■	■		■	LARGE LAWN AREA	NOT RECOMMENDED-WOULD DEGRADE AREA	
TOPOGRAPHY	■	■				■					■	EASTERN PLANTING BED IS 3-6' HIGHER	NOT RECOMMENDED-WOULD DEGRADE AREA	
VEGETATION	■	■		■	■	■		■		■	■	LAYERED WOODLAND PLANTINGS & LAWN AREA	NOT RECOMMENDED-WOULD DEGRADE AREA	
PATHWAYS	■			■							■	ONLY EXIST AT ENTRANCES & EXITS	SECONDARY PATHWAYS TO WOODLAND GLADE	
WILD PLACES	■			■		■	■	■		■	■	ANIMAL TRAILS LEAD INTO WESTERN PLANTING AREA	NOT RECOMMENDED-WOULD DEGRADE AREA	
EPHEMERAL	■		■	■	■	■		■		■	■	VEGETATION RESPONDS TO CHANGE IN SEASONS	AREAS OFF THE PATH OFFER WILD WOODLAND EXPERIENCES	
SENSE OF PLACE	■			■		■	■	■			■	PEACEFUL & SERENCE SPACE	NOT RECOMMENDED-WOULD DEGRADE AREA	
PETER PAN MOMENT		■		■	■	■	■	■		■	■	STONE WALL, BENCH, VEGETATION OFFER OPPORTUNTIES	NOT RECOMMENDED-WOULD DEGRADE AREA	
SECRET SPACE											■		NOT RECOMMENDED-WOULD DEGRADE AREA	
RESPITE & RENEWAL	■			■	■	■		■			■	LAWN AREA OFFERS PASSIVE RECREATION	NOT RECOMMENDED-WOULD DEGRADE AREA	
NARRATIVE	■			■	■	■	■	■	■		■	AREA USED FOR GATHERINGS & CEREMONIES	NOT RECOMMENDED-WOULD DEGRADE AREA	
VIEWS & VISTAS	■					■		■			■	LIMITED DUE TO CANOPY	NOT RECOMMENDED-WOULD DEGRADE AREA	
SUMMARY	■	■	■	■	■	■	■	■	■	■	■			

Appendix A 96

DESIGN ELEMENTS	CHARACTERISTICS					BENEFITS					DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL		
CHESTNUT LODGE & ROOF GARDEN												
LOOSE PARTS											VEGETATION	NOT RECOMMENDED-WOULD DEGRADE AREA
STATIONARY OBJECTS											BENCHES, SEATWALL, BOULDERS, FALLEN TREES, & SCULPTURE	NOT RECOMMENDED-WOULD DEGRADE AREA
WATER											GREEN ROOF & PERMEABLE PAVING	NOT RECOMMENDED-WOULD DEGRADE AREA
OPEN SPACES											THREE STONE PATIO AREAS & SMALL LAWN AREA	NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY											STEEP GRADE CHANGE FROM ROOF TO LOWER LEVEL	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION											LAYERED & DIVERSE PLANTINGS WITH SPECIMEN NATIVE PANTS	NOT RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS											VARIETY IN MATERIAL, WIDTH, & GRADE	NOT RECOMMENDED-WOULD DEGRADE AREA
WILD PLACES												NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
EPHEMERAL											VEGETATION RESPONDS TO CHANGE IN SEASONS	NOT RECOMMENDED-WOULD DEGRADE AREA
SENSE OF PLACE											FOOTPRINT OG LODGE NESTLES INTO THE TOPOGRAPHY	NOT RECOMMENDED-WOULD DEGRADE AREAS
PETER PAN MOMENT											BOULDERS, TOPOGRAPHY, & VEGETATION OFFER OPPORTUNITIES	NOT RECOMMENDED-WOULD DEGRADE AREA
SECRET SPACE												NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
RESPIRE & RENEWAL											STONE PATIOS, FALLEN TREES, & BENCHES OFFER OPPORTUNITIES	NOT RECOMMENDED-WOULD DEGRADE AREA
NARRATIVE											MATERIALS & DESIGN CREATE A STORY	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS											LIMITED BY VEGETATION	NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY												

DESIGN ELEMENTS WOODLAND GLADE	CHARACTERISTICS					BENEFITS					DESCRIPTION OF EXISTING ELEMENTS	EXAMPLES OF DESIGN OPTIONS WITH NATURE PLAY ELEMENTS
	LEGIBILITY	VARIETY	MYSTERY	SENSORY	ACCESSIBILITY	COGNITIVE	SOCIAL	EMOTIONAL	CULTURAL	EDUCATIONAL		
LOOSE PARTS											VEGETATION	NOT RECOMMENDED-WOULD DEGRADE AREA
STATIONARY OBJECTS											BENCH, FALLEN TREE	SCULPTURE OR BOULDERS
WATER												NOT RECOMMENDED-WOULD DEGRADE AREA
OPEN SPACES												NOT RECOMMENDED-WOULD DEGRADE AREA
TOPOGRAPHY											PRIMARILY LEVEL & VARIES AT ENTRANCES/EXITS	NOT RECOMMENDED-WOULD DEGRADE AREA
VEGETATION											CATHEDRAL LIKE EXPERIENCE WITH CANOPY & GROUNDCOVERS	NOT RECOMMENDED-WOULD DEGRADE AREA
PATHWAYS											VARIETY WIDTH & MATERIAL	NOT RECOMMENDED-WOULD DEGRADE AREA
WILD PLACES												NOT RECOMMENDED-WOULD DEGRADE AREA
EPHEMERAL											VEGETATION RESPONDS TO CHANGE IN SEASONS	NOT RECOMMENDED-WOULD DEGRADE AREA
SENSE OF PLACE											SPATIAL RELATION OF VEGETATION	NOT RECOMMENDED-WOULD DEGRADE AREA
PETER PAN MOMENT												NOT RECOMMENDED-ADDRESSED IN ANOTHER AREA
SECRET SPACE												NOT RECOMMENDED-WOULD DEGRADE AREA
RESPIRE & RENEWAL											TRAIL OFFERS CONNECTION TO NATURE	BENCHES OR BOULDERS
NARRATIVE											CATHEDRAL LIKE EXPERIENCE	NOT RECOMMENDED-WOULD DEGRADE AREA
VIEWS & VISTAS											LIMITED DUE TO CANOPY	NOT RECOMMENDED-WOULD DEGRADE AREA
SUMMARY												

WOODLAND GLADE DIAGRAM INVENTORY



Legend

Creeks

Roads

Trails

Vaseyi Pond

Structures

Canopy

LooseParts

Stationary Objects

Water

Open Spaces

Topography

Wild Places

Ephemeral

Genus Loci

Peter Pan Moment

Sacred Play Space

Respite & Renewal

Narrative

Views

AZALEA WALK DIAGRAM INVENTORY

Legend

Tangible Elements

Intangible Elements

Creeks

Roads

Trails

Vaseyi Pond

Structures

Canopy

LooseParts

Stationary Objects

Water

Open Spaces

Topography

Wild Places

Ephemeral

Genus Loci

Peter Pan Moment

Sacred Play Space

Respite & Renewal

Narrative

Views

AZALEA WALK

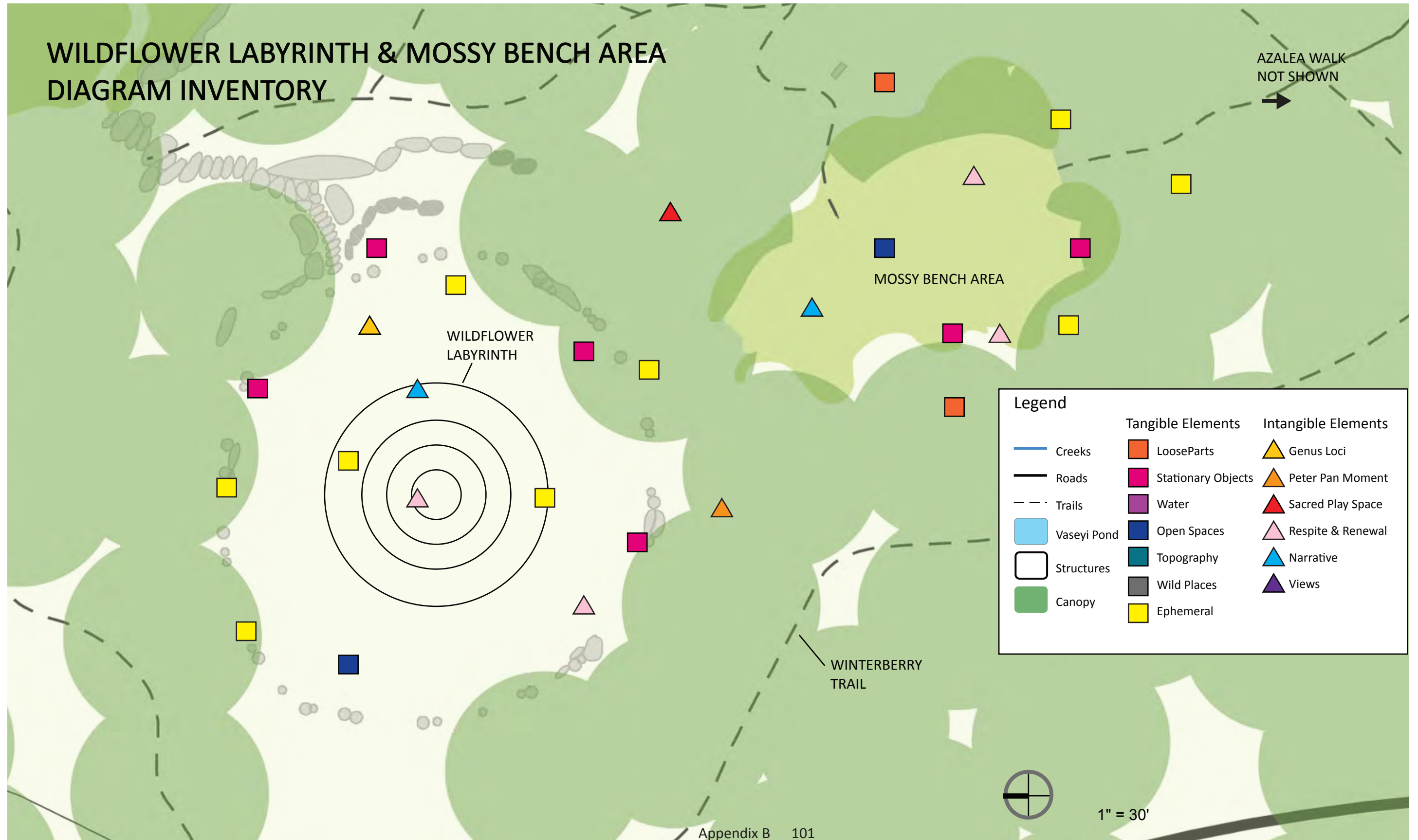
WINTERBERRY TRAIL

VIA FERRATA
NOT SHOWN

Appendix B 100

1" = 30'

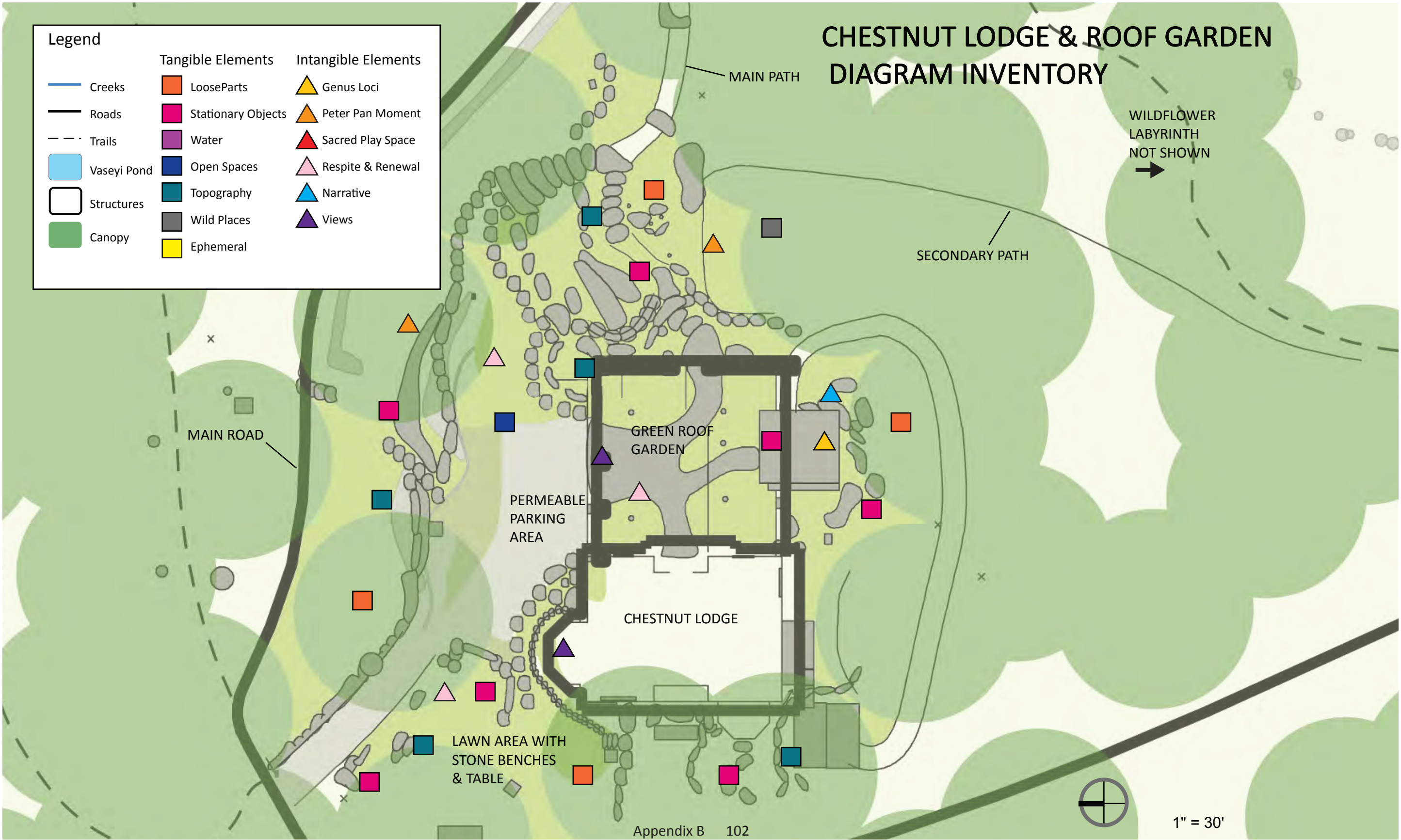
WILDFLOWER LABYRINTH & MOSSY BENCH AREA DIAGRAM INVENTORY



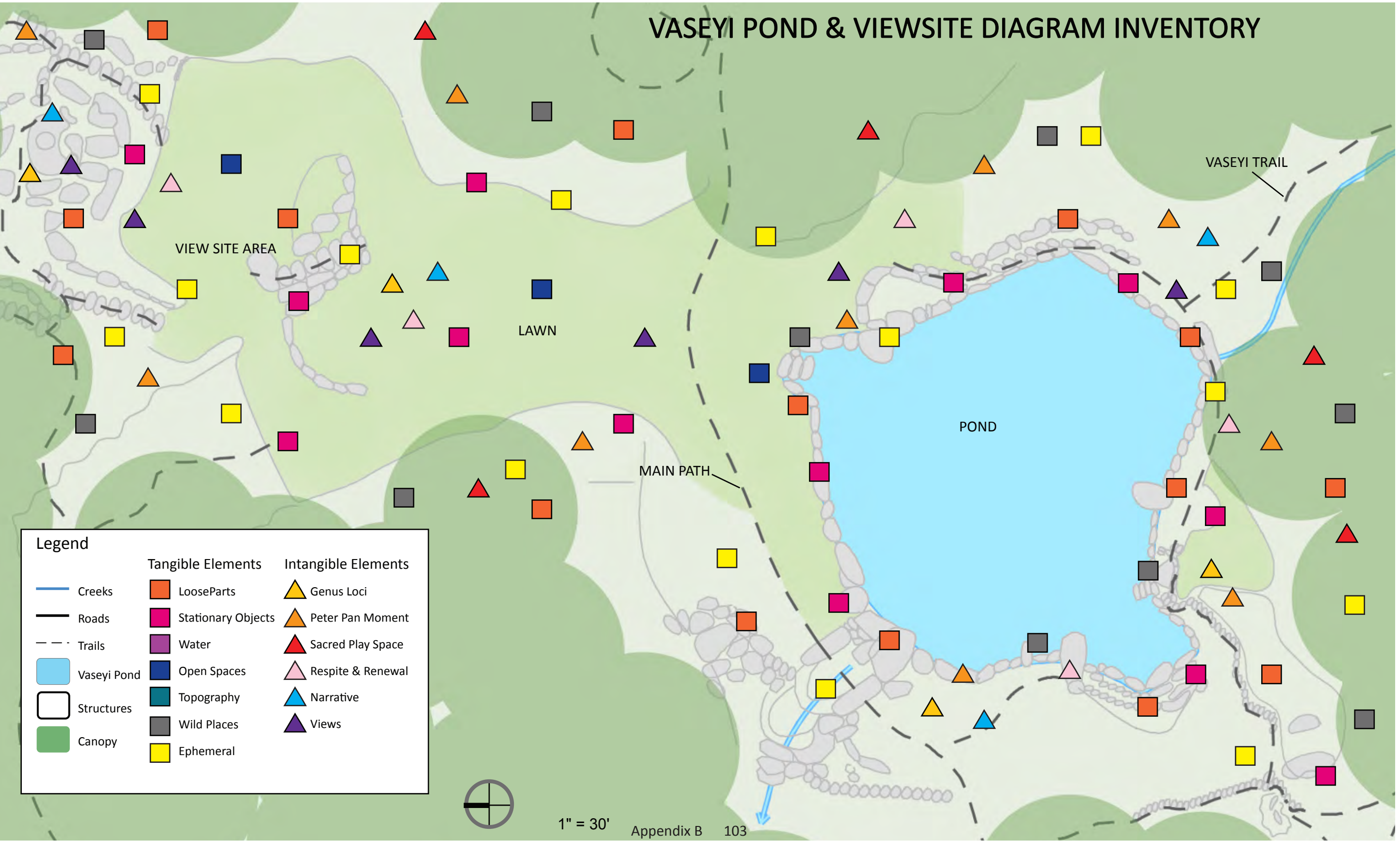
CHESTNUT LODGE & ROOF GARDEN DIAGRAM INVENTORY

Legend

Creeks	Tangible Elements	Intangible Elements
Roads	LooseParts	Genus Loci
Trails	Stationary Objects	Peter Pan Moment
Vaseyi Pond	Water	Sacred Play Space
Structures	Open Spaces	Respite & Renewal
Canopy	Topography	Narrative
	Wild Places	Views
	Ephemeral	






















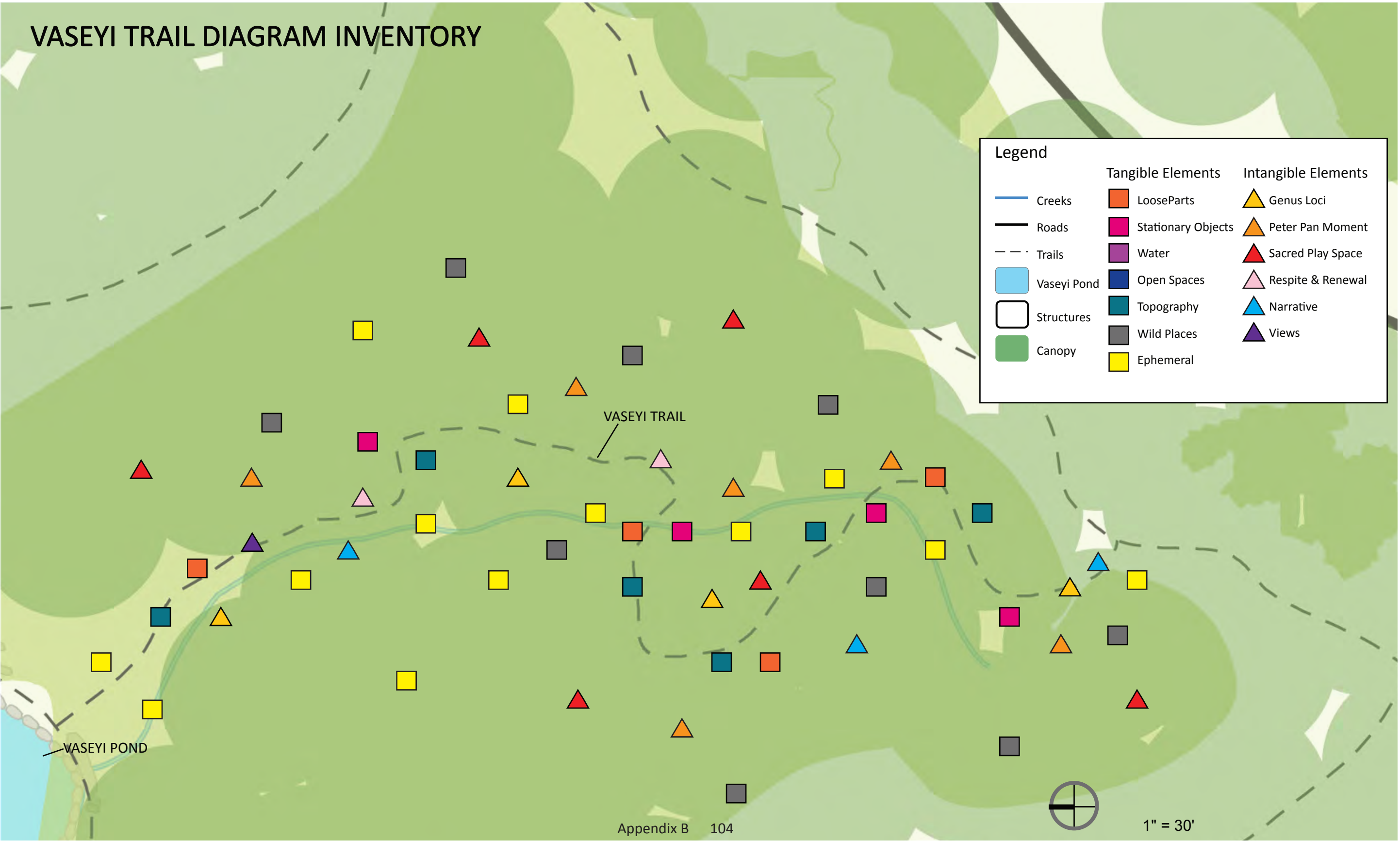
VASEYI POND & VIEWSITE DIAGRAM INVENTORY



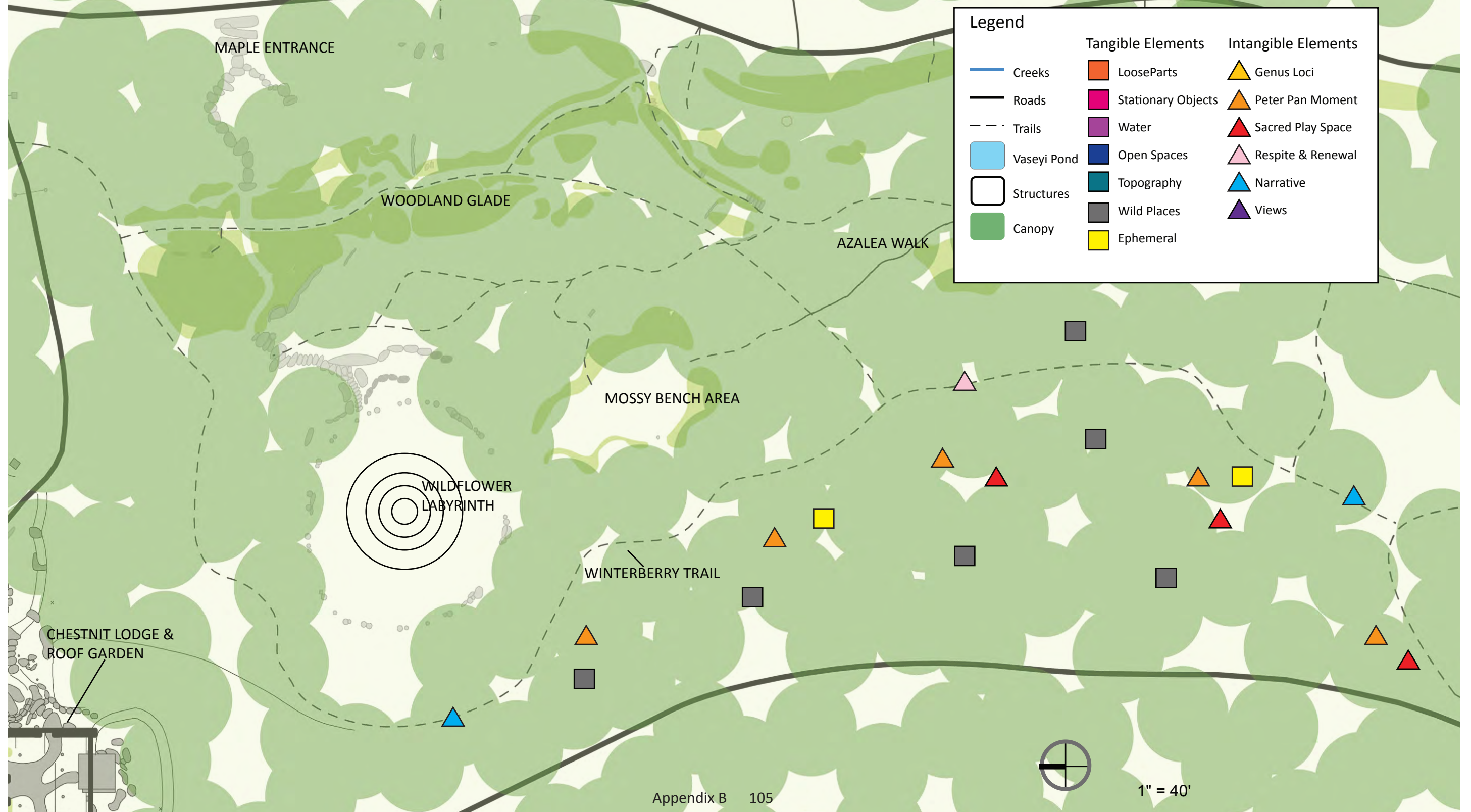
VASEYI TRAIL DIAGRAM INVENTORY

Legend

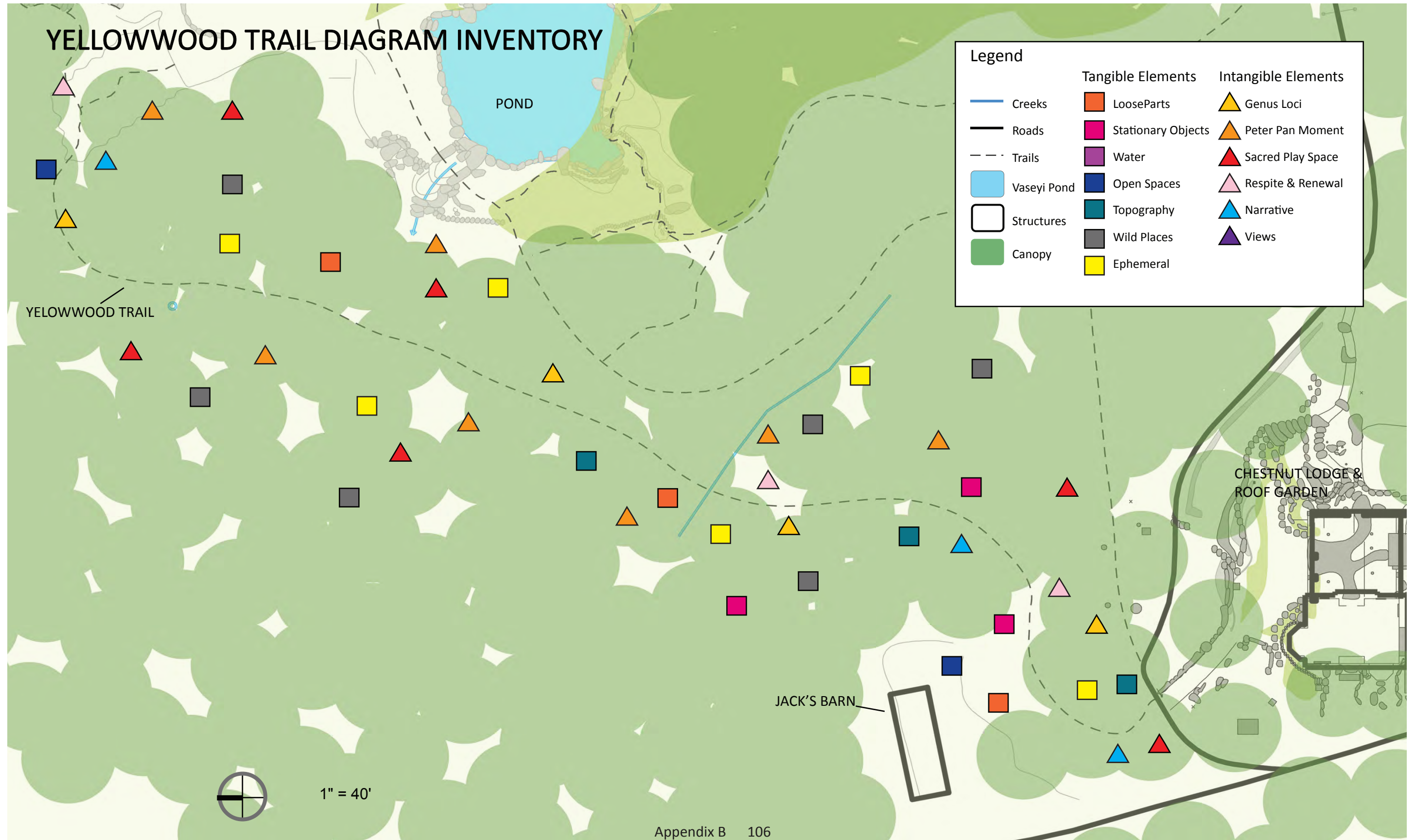
 Creeks	 LooseParts	 Genus Loci
 Roads	 Stationary Objects	 Peter Pan Moment
 Trails	 Water	 Sacred Play Space
 Vaseyi Pond	 Open Spaces	 Respite & Renewal
 Structures	 Topography	 Narrative
 Canopy	 Wild Places	 Views
	 Ephemeral	



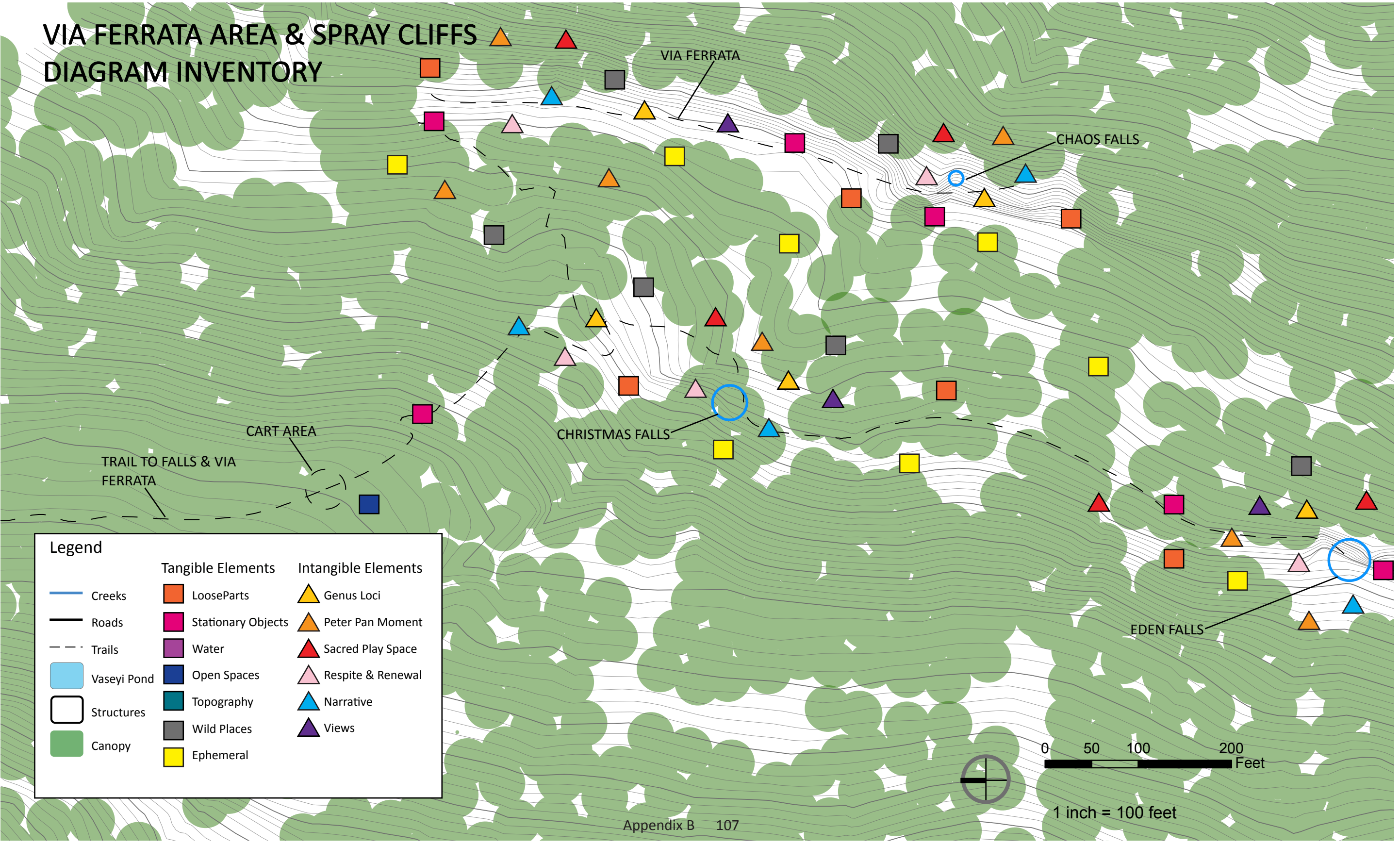
WINTERBERRY TRAIL DIAGRAM INVENTORY



YELLOWWOOD TRAIL DIAGRAM INVENTORY



VIA FERRATA AREA & SPRAY CLIFFS
DIAGRAM INVENTORY



SOUTHERN HIGHLANDS RESERVE: SITE MAP



SOUTHERN HIGHLANDS RESERVE: SITE MAP

Legend

- Creeks
- Roads
- Trails
- Vaseyi Pond
- Structures
- Canopy

