

Environmental Education in the Flint Hills: exploring recreational and educational opportunities  
for accessible use at Washington Marlatt Memorial Park in Manhattan, Kansas

by

Anna Grace Vialle

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

Department of Landscape Architecture and Regional & Community Planning  
College of Architecture, Planning, and Design

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

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Approved by:

Major Professor  
Lee R. Skabelund

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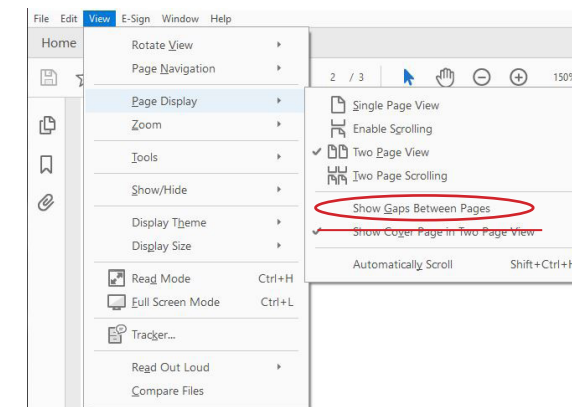
## Abstract

Many people who experience the Flint Hills never truly understand its full history, the importance of the prairie, and how the ecoregion serves the surrounding community and its opportunities for environmental education. There has been research on the history and purpose of environmental education and ecotourism, but can be a disconnect between the kinds of tourism or educational programming incorporated into a destination, and a failure to recognize that all tourism sites can incorporate environmental education and ecotourism opportunities if they meaningfully connect people to the ecoregion where they reside. This Master's Report identifies Washington Marlatt Memorial Park (WMMP) as a site with existing outdoor programming but without current plans for the introduction of environmental education, ecotourism, or a nature center. This research provides several possible design solutions that center on a nature center to serve as a community resource for opportunities within the site to improve the human-nature connection for all. Furthermore, this project report emphasizes the historical, cultural, environmental, restorative, and aesthetic value of the Flint Hills Ecoregion and its connection to these educational opportunities. Additionally, this report gives insight into the specific qualities of this site and the connections between WMMP and its biophysical and socio-cultural context. Analysis of relevant literature, exploration of existing conditions related to WMMP, analysis of nature center and ecotourism precedents, and reflections on the way WMMP can help all visitors appreciate the Flint Hills Ecoregion help guide proposed programming and design strategies. Drawing inspiration from precedent studies, relevant education-based design strategies are identified and used to enhance the environmental education and ecotourism opportunities for WMMP. The conceptual design allows WMMP to serve as a highly interactive nature center destination where important recreation and education activities are physically accessible to serve as a community resource.





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A Report submitted in partial fulfillment of the requirements for the degree:  
Master of Landscape Architecture

Department of Landscape Architecture and Regional & Community Planning  
College of Architecture, Planning, & Design  
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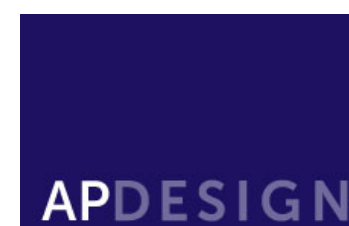
Lee R. Skabelund, Associate Professor, Department of LARCP

Kimberly With, Professor, Division of Biology

Ryan Sharp, Associate Professor, Department of Park Management & Conservation

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# ENVIRONMENTAL EDUCATION IN THE FLINT HILLS

Exploring Recreational and Educational Opportunities  
for Accessible Use at Washington Marlatt Memorial Park in  
Manhattan, Kansas

Anna Vialle  
Master's Report  
Landscape Architecture  
Spring 2023







**Figure 0.1** Tallgrass Prairie at Konza Prairie (Vialle 2022)

## ABSTRACT

Many people who experience the Flint Hills never truly understand its full history, the importance of the prairie, and how the ecoregion serves the surrounding community and its opportunities for environmental education. There has been research on the history and purpose of environmental education and ecotourism, but can be a disconnect between the kinds of tourism or educational programming incorporated into a destination, and a failure to recognize that all tourism sites can incorporate environmental education and ecotourism opportunities if they meaningfully connect people to the ecoregion where they reside. This Master's Report identifies Washington Marlatt Memorial Park (WMMP) as a site with existing outdoor programming but without current plans for the introduction of environmental education, ecotourism, or a nature center. This research provides several possible design solutions that center on a nature center to serve as a community resource for opportunities within the site to improve the human-nature connection for all. Furthermore, this project report emphasizes the historical, cultural, environmental, restorative, and aesthetic value of the Flint Hills Ecoregion and its connection to these educational opportunities. Additionally, this report gives insight into the specific qualities of this site and the connections between WMMP and its biophysical and socio-cultural context. Analysis of relevant literature, exploration of existing conditions related to WMMP, analysis of nature center and ecotourism precedents, and reflections on the way WMMP can help all visitors appreciate the Flint Hills Ecoregion help guide proposed programming and design strategies. Drawing inspiration from precedent studies, relevant education-based design strategies are identified and used to enhance the environmental education and ecotourism opportunities for WMMP. The conceptual design allows WMMP to serve as a highly interactive nature center destination where important recreation and education activities are physically accessible to serve as a community resource.

*“The hardest part of anything, is getting started...”*  
– Grandpa

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# GLOSSARY

## Environmental education

“the process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment” (EPA 2022).

## Nature center

“A facility that brings environments and people together under the guidance of trained professionals to experience and develop relationships with nature. A nature center serves its community and fosters sustainable connections between people and their environment” (NAI 2007).

## Ecotourism

“Responsible travel to natural areas, which conserves the environment and improves the welfare of local people focusing on the three key factors of economic, environmental, and social benefits” (Honey 2008, 235).

## Tourism

“The business activity connected with providing accommodation, services and entertainment for people who are visiting a place for pleasure” (Tourism n.d.).

## Nature-based tourism

“Travel to natural or undeveloped places to experience and enjoy the outdoors” (Honey 2008, 239).

## Adventure tourism

“Travel requiring physical skill and endurance to engage in challenging nature activities” (Steward 2017, 8).

## Sustainable tourism

“Tourism that is economically viable, but does not does destroy the resources on which the future of tourism will depend, notably the physical environment, and the social fabric of the host community” (Honey 2008, 235).

## Ecological design

“any form of design that helps to minimize the environmentally destructive impacts by integrating itself with living processes, patterns, and nature” (Sim Van der Ryn et al n.d.).

## Human-nature connection

“How people think about, feel toward, and conceive of relationships with more-than-human aspects of the world” (Muhar et al. 2018).

## Ecoregion

“Areas where ecosystems (and the type, quality, and quantity of environmental resources) are generally similar” (EPA n.d.).

## Flint Hills

“A unique tallgrass prairie ecosystem found in central North America centered on Kansas and northern Oklahoma (where they are known as the Osage Hills). It is a temperate grassland, marked by a few trees but abundant forbs and grasses” (“What Are the Flint Hills? n.d.).

## Restoration

“Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” (Society for Ecological Restoration/SER, 2019 15).

## Preservation

“Protecting the environment from harmful human activities” (National Geographic n.d).

## Education

“Instruction or training that develops the general abilities of the mind and results in learning new material” (Law Insider 2023).

## Vulnerability

The likelihood of changes, loss of features of a landscape, and the analysis and identification of the level of impact it could leave on a particular area of a site (Vialle 2023).

## Suitability

Areas that are well-suited to the needs, requirements, and goals of the selected site or location on a piece of land/property (Vialle 2023).





Figure 1.0 Konza Prairie Research Area (Hammel 2020)

# 1 Introduction

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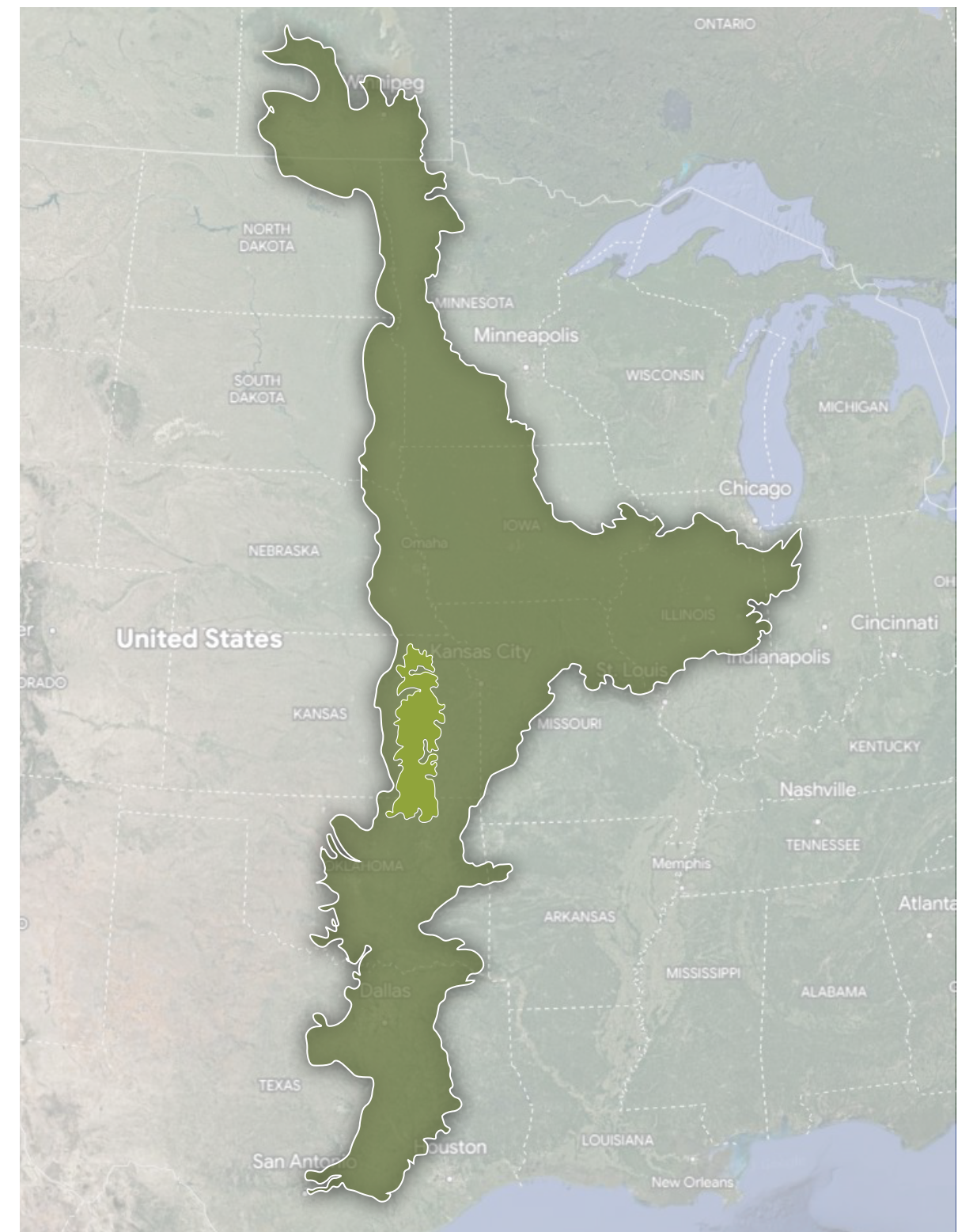
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# 1 INTRODUCTION

My research focuses on studying the ways that environmental education can be better connected through existing tourism and naturalized sites within the Flint Hills Ecoregion in addition to enhancing the human-nature connection. I want to form new ways for people to better immerse themselves in the Flint Hills tallgrass prairie not only to experience the beauty of the tallgrass but to understand the relevance it has to how successful and conscious design can form educational opportunities. I want my readers to learn how the prairie came to be through a historical literature review to provide background for the selected site and then lead them to effective methodology and successful projective design. The goal is to disseminate knowledge on environmental education through nature centers and how to use restorative tallgrass prairie design strategies to form stronger connections to the ecoregion and provide educational opportunities for the Riley County community. Through this proposal and report, topics like ecotourism, environmental education, the history of the Flint Hills and others will bring insight to contributing topics and lead to a educational and accessibility-focused projective design. I centered my research on environmental education, the opportunities of a new nature center, and the Flint Hills history to better understand the past compared to the current state of the tallgrass prairie and the selected site. This report includes the value of the selected site location: Washington Marlatt Memorial Park (WMMP) and its environmental characteristics — and explores a new (or projective) nature center design.

The topics of ecotourism, ecological design, and environmental education introduce the type of tourism and education that formed the goals for WMMP. This leads to a better understanding of the various activities that correspond with tourism and education. The outcome of my research can support regionally-focused prairie restoration effort along with an environmental education strategy to help increase the opportunities and accessibility at WMMP. A projective nature center design could be a way to support tallgrass prairie restoration and management and ecotourism programming — and provide a reference for ecotourism design within the Riley County area and serve as a community resource for environmental education.



**Figure 1.1** The Flint Hills and The Tallgrass Prairie. (Vialle 2023)  
Source of Base Map: (Google Earth 2023)



## PERSONAL INTEREST IN THE PROJECT

I have always had a love for exploration and being outside in nature. From playing in my backyard to traveling to beautiful places across the country, growing up in northeast Kansas has changed the way that I view discovery and wandering the outdoors. I grew up playing in the mud and learning about nature and yearning for more ways to connect with my surrounding environment. My family has always been a very adventurous one. With sports, relatives who live out of state, and our own individual activities and interests, we have been able to participate in many forms of tourism. I wanted my research to pertain to something I truly had a passion for, namely nature-based exploration and education. I recognized a need for ecotourism enhancement and environmental education within the Flint Hills and have the desire to explore opportunities to leave an impact on the City of Manhattan, Kansas, where I grew my love for landscape architecture and the home of my alma mater.

## CENTRAL DILEMMA

With my own communications, research, and experiences related to tourism, I have found that there seems to be a slight disconnect on the positive and negative relationships between different types of tourism and their impacts. With climate change, pollution, resource depletion, and overconsumption, the negative tourism impacts have too frequently out-weighed the benefits. With tourism growing rapidly with billions of participants, ecotourism has the potential to lead as a resilient and responsible community resource, and merge with other sustainability efforts, to help manage our environment and reduce inefficient resource use (UNWTO 2020). Ecotourism and educational proponents have called for greater respect for natural systems and local cultures while providing experience and adventure for the Riley County community. Nature-based tourism (i.e. ecotourism and education tourism) is very important, and environmental education brings people closer to nature. Without a nature center, this shows the lack of educational opportunities, community resources, and in turn, minimizes the value of education about local landscapes.

With the dilemma of how to effectively couple tourism, education, and conservation, one may ask: how many forms of tourism can be available in a select tourist destination? Tourism types and other forms of programming such as environmental education can be integrated at a single site, park, or natural area, but currently the selected site has a limited range of opportunities. For example, WMMP is considered a public tallgrass prairie park due to the history and its current primary functions of conserving prairie ecosystems, but there currently is a lack of educational resources and engaging programming. It contains herbaceous and wooded riparian corridors, multiple trails, spaces for viewing site context (such as the Top of the World overlook), and open access to all who can walk and hike on the unpaved parking areas and trails. If this site were to be established as a more formal nature center, it could provide a strong community resource for nature engagement, environmental educational programming, and improved accessibility. A nature center would provide seasonal comfort to a wider range of people, young and old, introducing more residents and visitors to the beauty and ecological functions of the local landscape and ecosystems within the Flint Hills. It could compliment what is being shared at the much more urban Flint Hills Discovery Center, while also expanding on the experiences of the Konza Prairie Biological Station. WMMP could thus become an environmental educational destination to serve as a successful community resource.

## RESEARCH QUESTION:

***How can the Flint Hills Ecoregion be responsibly used as a community resource for human-nature connections to the tallgrass prairie, and use ecological design strategies to enhance and increase educational opportunities for the existing naturalized site at Washington Marlatt Memorial Park?***

## SECONDARY QUESTIONS

Related to effective environmental education and ecotourism development, the following were considered:

- *What is the historical significance of the Flint Hills Ecoregion?*
- *What aspects of the tallgrass prairie ecosystem need to be shared via education and interpreted in ways that can be sustainably managed over time?*
- *Does interacting with natural systems at nature centers assist or harm tallgrass prairie ecosystems?*
- *How does the design of environmental education-focused areas directly impact air, water, soils, natural habitats and biodiversity, and ecosystem functions and services?*
- *What human-nature interactions support ecosystem management and education?*
- *What does restorative design and environmental educational look like for this site?*
- *How can we provide improved access to Marlatt Park for visitors with a range of physical abilities?*
- *What does successful environmental education at Marlatt Park help with larger regional tourism/ecotourism goals?*

## IMPORTANCE

Environmental education and ecotourism are interrelated due to more people wanting to travel for beneficial outdoor experience, enjoyment of environmental diversity, and an increased awareness of the benefits of having a human-nature connection. Tourism has been identified as a strong contributor to various types of pollution and, if not managed wisely, can harm the functions of natural environments and ecosystems such as the Flint Hills. With poor design and development in a number of locations, many ecosystems and landscapes like the Flint Hills are being threatened by poor human-nature interactions. Ecotourism has the potential to create a positive ecological, educational, and community impact if merged with the implementation of environmental education programming.

Restorative design, environmental management, and ecotourism revolve around how successful humans interact with nature and alter ecological systems through responsible design. Activities that relate to ecological restoration and management with an emphasis on environmental education and low-impact design could bring aspects of ethical decision making to help better preserve natural environments and learn about it from within the Flint Hills. Through education and interacting with the environment them in ways that maintain healthy environments all supported by effective design and implementation strategies.

## PROJECT VISION

This research examined environmental education, ecotourism, and nature-based experiences for the WMMP in Manhattan, Kansas using ecosystem inspired design. A primary goal was enhancing the existing site, provide a place for unique community engagement, flexible outdoor exploration, and educational programming.

## SITE OPPORTUNITY

There are multiple areas within the Flint Hills Ecoregion that are used for agriculture (native prairie pasture and annually-burned grasslands). There are also urban, residential and private developments that are near the selected site. With the hilly, rocky Flint Hills, and the agricultural floodplain, there are constraints related to development. With the existing dynamic of tallgrass prairie management, hiking, and free exploration, WMMP has the opportunity for more engaging programming and a new environmental education-focused nature center.

## RELEVANCE

This topic of ecotourism is applicable due to the historical relevance of the Flint Hills Ecoregion. Because the Flint Hills successfully preserves nearly 80% of remaining tallgrass prairie (The Nature Conservancy n.d.), the landscape provides beautiful unique plant life, invites opportunities to manage and or restore regional plant communities, and implement environmental education and ecotourism programming.



## KEY RELATIONSHIPS OF WMMP

### COLBERT HILLS GOLF COURSE:

Colbert Hills is a public golf course nearby WMMP, and is relevant due to proximity (<0.5 miles) and ecosystem management. This golf course is an 18-hole links style golf course that utilizes the natural ecosystem of the Flint Hills, and provides several amenities and lodging opportunities. With the golf course being a links style course (open parkland) with few trees, the unique tallgrass species and speaks to the character and aesthetic of the Flint Hills tallgrass prairie.

### HUDSON NATURE TRAIL:

The Hudson Nature Trail is a short trail experience located in Manhattan. This trail runs along Hudson Avenue connecting to Anderson Avenue and provides a direct connection to WMMP. This trail is mostly paved, with some gravel areas, and is used for biking, walking, hiking and exploration. This connection is important as it ties to the Frank Bergman Elementary School and can be used to enhance site accessibility.

### FRANK BERGMAN ELEMENTARY SCHOOL:

WMMP is near Frank Bergman Elementary School, a highly rated, K-6 public elementary school with approximately 490 students and a 12:1 student-teacher ratio. This local elementary school is near WMMP and connected via the Hudson Nature Trail (“Explore Frank v. Bergman Elementary School” 2023).

### SUSAN B. ANTHONY MIDDLE SCHOOL AND COMMUNITY CENTER:

East of Seth Child (US Highway 113) and accessible by pedestrian/bike trail, roads, and the Hudson Nature Trail to WMMP.

### FLINT HILLS DISCOVERY CENTER:

The Flint Hills Discovery Center is a local attraction in downtown Manhattan (approximately 4.5 miles) that offers educational and interactive exhibits for all age groups. It also serves as an events space and a community resource.

### KANSAS FARM BUREAU:

The Kansas Farm Bureau is a non-profit advocacy organization that exercises leadership development, agricultural outreach, legal defense, farm safety measures, risk management, and many others (This is a relevant relationship due to close proximity (<0.5 miles) and their mission to strengthen agriculture and the lives of Kansas residents through advocacy and education. A woodland area (dominated by Eastern Red Cedar) is adjacent to the border of WMMP.

### COUNTY, CITY, AND UNIVERSITY PARKS AND NATURAL AREAS:

Currently Riley County, the City of Manhattan, and Kansas State University manage the following parks/natural areas (all within 12 miles of WMMP): Konza Prairie (owned by The Nature Conservancy and managed by KSU faculty and staff); Roger Schultz Park (managed by the City of Manhattan with technical support from the National Park Service); Northeast Community Park, Warner Park, Wildcat Creek woodland trails below Sunset Zoo, and the Girl Scout House and Claflin Road/Pioneer pollinator parks (managed by the City of Manhattan with support from volunteers); and Keats Park and Fairmont Park (managed by Riley County).

### FORT RILEY:

Fort Riley is a United States Army installation that is located between Junction City and Manhattan, Kansas, around 12 miles away from WMMP. It is home to many active service members, family members, veterans, and local resident retirees. The base is considered to be part of the site context due to it being a potential influence. Although the army base does not directly connect to the WMMP property, this is a relevant relationship due to the noise frequently emanating from Fort Riley training operations.

### RESIDENTIAL AREAS:

The selected site is in close proximity to several residential neighborhoods. Possible strategies for enhancing connections between residential areas include updated trails and additional bike paths.

## GOALS

- *Identify and enhance environmental education within the Flint Hills Ecoregion / Riley County Area.*
- *Educate about tourism and its negative effects and benefits.*
- *Understand the existing programming of Washington Marlatt Memorial Park (WMMP).*
- *Understand how precedents and existing programming can enhance or benefit the human-nature connection and environmental education within the Flint Hills through the site of WMMP.*
- *Provide examples of how a responsible environmental and ecotourism framework could be implemented by examining parks, conservation areas, and projects around the U.S.*
- *Use precedents and successful projects that can help guide the WMMP to a more well-rounded nature center within WMMP.*
- *Establish and maintain site facilities to help manage and reduce the human disturbance of the site.*
- *Update the trail systems and programming opportunities to encourage users to remain and utilize the site's full potential.*
- *Update the park through the utilization of conservation areas, surrounding site context, local attractions, to enhance the dynamic of the park while avoiding any areas of vulnerability or disturbance.*
- *Identify and adapt disturbed and degraded areas for ecological restoration, conservation, educational enhancement, and ecotourism opportunities to help rebuild the quality of these parts of WMMP.*
- *Deepen the knowledge of environmental education within the Flint Hills.*

## WHAT TO EXPECT

The project focus, personal interests in the project and goals for the Master's Report are outlined throughout the Background, Methods, and Anticipated Findings. The purpose of this report is to provide information on the selected project site, with a corresponding literature review on relevant topics for the projective design. A new nature center design for WMMP is proposed.

## PROJECT OUTCOMES

This project seeks to provide a better understanding about the importance of educational design principles and strategies and give insight to tallgrass prairie and sustainable restoration techniques. Sources such as ASLA's Universal Guidelines highlight design tactics, and help inform projective design explorations which seek to make the site more accessible. I have sought to make the environmental education at Marlatt Park immersive and inclusive.

## PROJECT EXTENT

This project considers the Flint Hills as surrounding and relevant context. Washington Marlatt Memorial Park is located in the northwest area of Manhattan and is considered a public park. The prairie is managed by burning and hiking trails are maintained. The park is around 164 acres and is the largest park in Manhattan, Kansas. Additional programming opportunities were identified and analyzed. The projective design explored new ideas for the selected site, with emphasis on the area north of Marlatt Avenue.





Figure 2.0 | Konza Prairie Trail (Hammel, 2020)

# Background

## contents

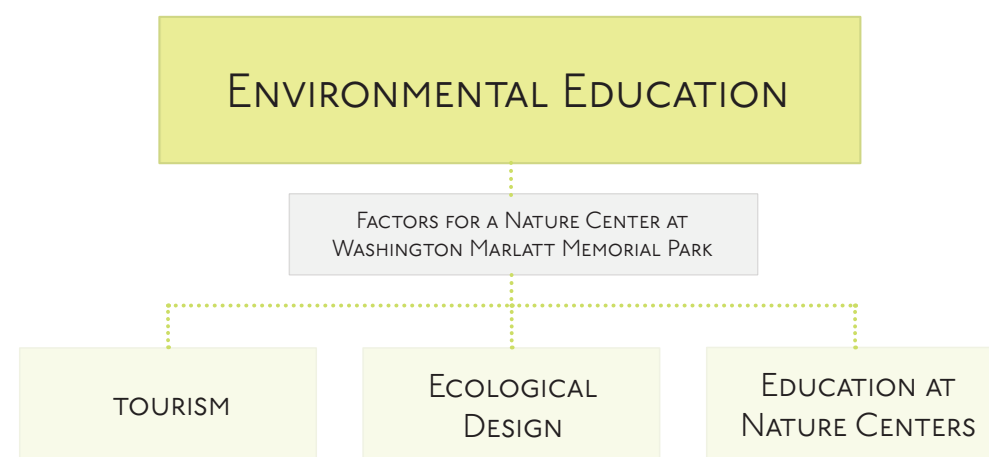
- overview
- environmental education
- ecotourism
- ecological design
- sustainability
- education at nature centers
- regional context: the Flint Hills Ecoregion
- site history & context: Washington Marlatt Memorial Park
- conclusion



# 2 BACKGROUND

Environmental education and ecotourism are two driving forces that bring humans and nature together. Ecotourism is directed at how we as humans interact with threatened, exotic, or natural environments. Environmental education helps people gain knowledge about ecosystems at various scales and serves as a resource for a community. Both have exercising the common goal of conserving and preserving natural areas. Using history and an ecoregional analysis and bringing in factors of education, the focus of this project is to identify and use ecotourism while implementing aspects of environmental education by designing within a beautiful environment.

This chapter discusses environmental education, ecotourism, ecological design, Marlatt Park’s site and regional context, and restorative design opportunities associated with the creation of a nature center. The last part of the chapter provides insight into the context of the Flint Hills Ecoregion and sheds light about how to encourage human-nature connections using landscape architecture, responsible design strategies, and nature center facilities and programming.



**Figure 2.1** Background on Environmental Education (Vialle 2023)

## OVERVIEW

Environmental education is among the largest growing travel-related industries. It has grown from small scale groups of travel to large groups with the purpose or goal of practicing responsible and environmentally sustainable travel. The tourism industry has moved from a more high-end accommodations to nature-based involvement with our environment. People participate in various forms of travel while simultaneously becoming more educated on the environments being visited (Weaver 2001).

Ecotourism and nature-based tourism became mainstream ways for travelers to be less destructive and achieve conservation and ecological development (Weaver 2001). For tourists, the main factor of exploration is participation with their surrounding environment and other socio-ecological factors that contribute to the knowledge of the places they are visiting. Through environmental education and other programming people are able to have closer human-nature connections (Weaver 2001).

Over the last few decades, tourism has been centered around being involved in adventure and exploration, emphasizing ecological education and management, all while trying to attract visitors and create destinations. Characteristics of ecotourism include preservation efforts, education, and tapping into place-and-people based attractions. A primary goal has been to couple making healthy travel practices with environmental conservation and education (Weaver 2001).



**Figure 2.2** Marlatt Park Looking East (Skabelund 2006)



ENVIRONMENTAL EDUCATION

Environmental education plays a key role on how people view their environment. The environment is what sustains all life on our planet and gives us inspiration, sustenance, and growth. Having a healthy environment means being able to assist and manage it correctly. Environmental education helps gain proper knowledge, is a resource for communities, and strengthens the human-nature connection (EPA 2022).

Environmental education is defined as:

*“the learning process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment” (EPA 2022).*



Figure 2.3 Dr. Tim Keane at Marlatt Park (Skabelund 2006)

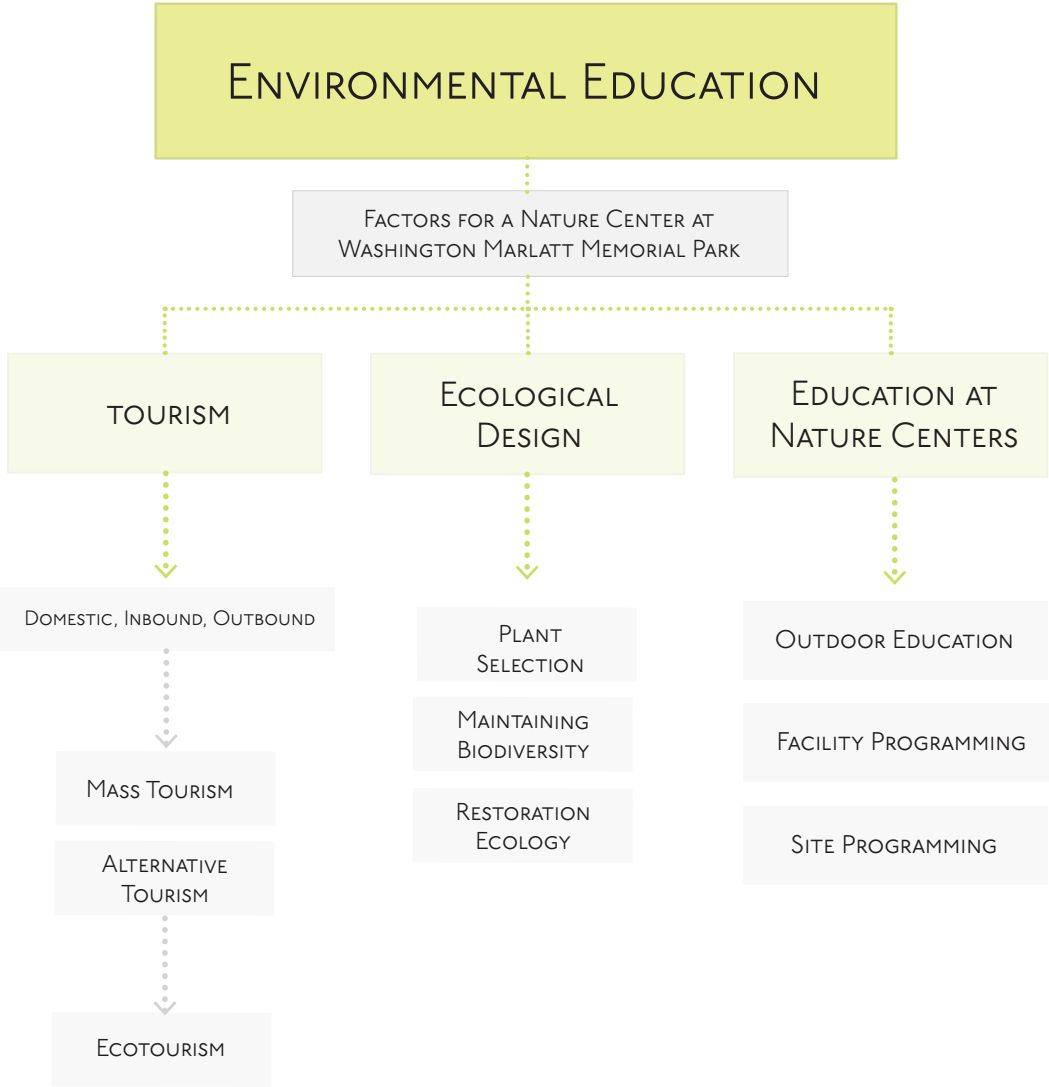


Figure 2.4 Environmental Education Factors Flowchart (Vlalle 2023)

## HISTORY OF ENVIRONMENTAL EDUCATION

Environmental education dates back to the 18th century when Jean-Jacques Rousseau spoke on the importance of education that centered around the environment. Decades later, his goals and philosophy were told to students and over time became a huge influence on educational programming (Galvin 2018).

A new form of environmental education emerged due to the Great Depression and the Dust Bowl and conservation education began to rise. This form focused on the natural world while also centering on strategies to address social, economic, and environmental issues (Galvin 2018).

After Earth Day was established in April 22nd, 1970, the Environmental Education Act was passed in 1990 to implement environmental education into K-12 schools, which has now lead to improved environmental literacy and school programs (EPA 1990). To this day environmental education still plays a huge role in outreach, community engagement, K-12 education, and professional careers. It has helped improve the state of education, helped guide environmental programs and serve as a foundation for an environmental framework and guidelines (Galvin 2018).

## COMPONENTS OF ENVIRONMENTAL EDUCATION

### **1. Awareness and sensitivity:**

To the environment and environmental challenges.

### **2. Knowledge and understanding:**

Of the environment and environmental challenges.

### **3. Attitudes:**

Of concern for the environment and motivation to improve or maintain environmental quality.

### **4. Skills:**

To identify and help resolve environmental challenges.

### **5. Participation:**

In activities that lead to the resolution of environmental challenges (EPA 2022).

## BENEFITS AND OPPORTUNITIES

Environmental education has many benefits and opportunities that can support the human-nature connection. Some of the benefits include raising awareness to address issues within an environment, serving as teaching opportunities for teachers and students, and supporting the actions for improving and sustaining the surrounding environment.

Other benefits include:

**1. Gaining new knowledge and critical thinking skills.**

**2. More experiential learning environments.**

**3. Encouraging cultural and historical engagement.**

**4. Exposing citizens young and old to nature.**

**5. Strengthening and supporting communities.**

**(Sustainable Forestry Initiative 2019).**

## GOALS OF ENVIRONMENTAL EDUCATION FOR THE SELECTED SITE

WMMP has the existing programming of free exploration of the trail system and burn management for the tallgrass prairie within the park. With the site being located within Riley County, where the existing connections to environmental education are the Flint Hills Discovery Center and the Konza Prairie Biological Station, this report references these two locations as inspiration for the environmental education and nature center theme for WMMP.



ECOTOURISM

Ecotourism falls under the category of alternative tourism which is a part of the larger category of tourism. Ecotourism is the a form of nature-based tourism which aims to learn, appreciate, and encourage nature-related outdoor experiences and has a focus on guiding or planning for programming. (see Figure 2.3)

According to The International Ecotourism Society (TIES), ecotourism is defined as:

*“Responsible travel to natural areas, which conserves the environment and improves the welfare of local people focusing on the three key factors of economic, environmental, and social benefits” (Honey 2008, 235).*

Ecotourism is a form of “tourism” and typically includes environmental education which engages those participating.

*Ecotourism is “the business activity connected with providing accommodation, services, and [engagement] for people who are visiting a place” (Tourism n.d.).*



Figure 2.5 Marlatt Park Exploration and Study (Skabelund 2006)

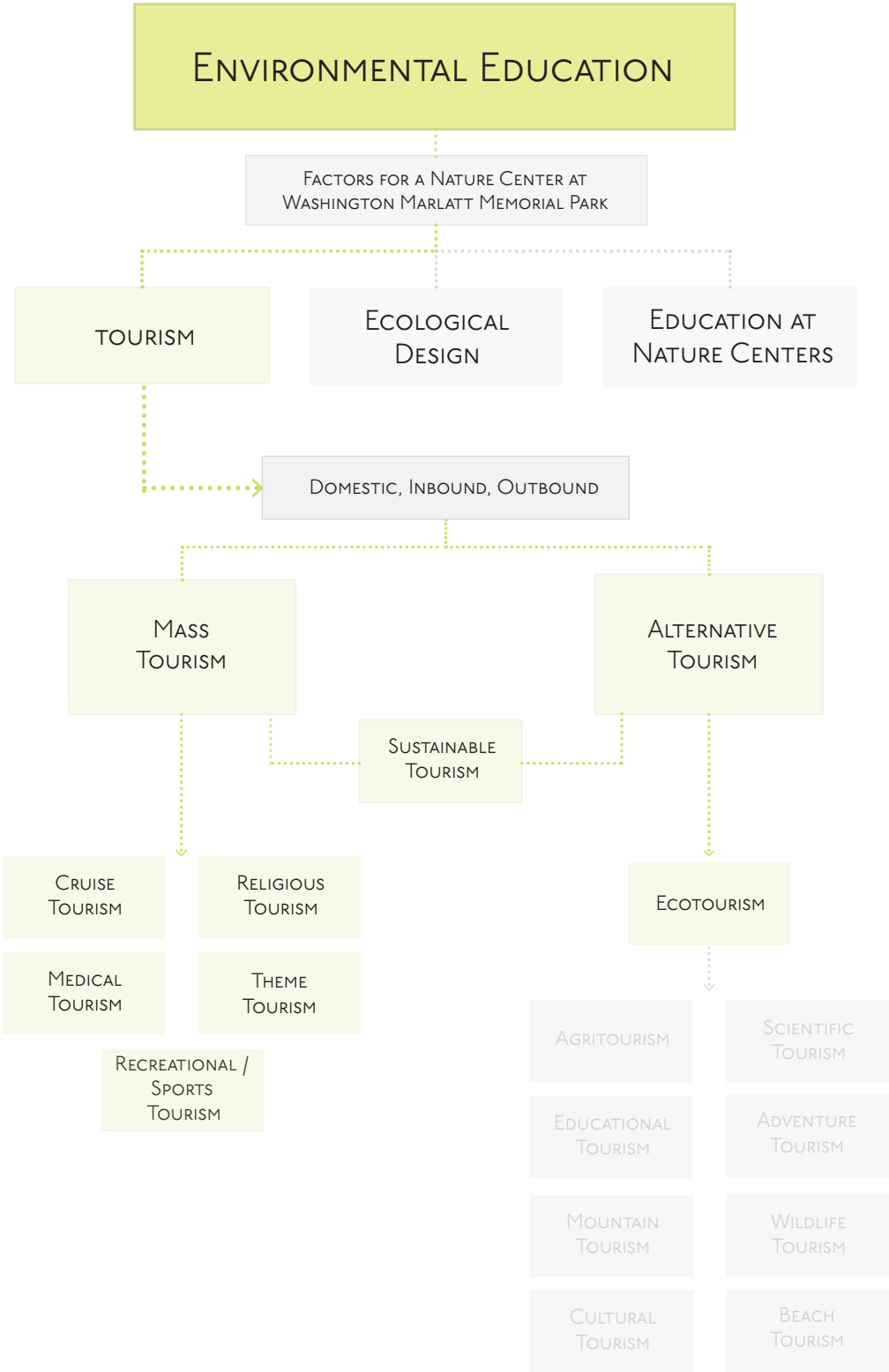


Figure 2.6 Tourism Background Branch (Vialle 2023)





**Figure 2.7** Exploring Konza Prairie (Skabelund 2009)

## HISTORY OF ECOTOURISM

Ecotourism is a type of alternative tourism and relates to sustainable development and is the natural outgrowth of mass tourism, which is when large numbers of people travel to the same place often has the same time. Ecotourism and mass tourism have evolved since the early 1980's but specific forms of alternative tourism continuously developed (Fennell 2009).

The idea was formally defined in the early 1980's, but ecotourism emerged in the 1970's focused around environmental-related travel along with any travel focused around learning while limiting environmental harm. "Ecotourism continues to be embraced and has recently been considered the antithesis of mass tourism because of its promise of achieving sustainability through conservation mindedness, community development, education and learning, and the promotion of nature-based activities that are sensitive to both ecological and social systems." The applications of ecotourism and/or sustainable development were "rapidly introduced into the larger industry of tourism and then merged into its own specific form of exploration" (Fennell 2009).

Ecotourism began to gain momentum in the 1990's along with its connections to environmental conservation. Through mainstream recognition, ecotourism continues to be more popular for participants who are becoming more environmentally conscious (Thompson 2016). In 2002, the United Nations declared it "the year of ecotourism" ("International Year of Tourism" 2002). In 2003, the Center for Ecotourism and Sustainable Development (CESD) was established and since then ecotourism has become a multi-billion dollar industry ("Mission & History" 2021).

## THE ECOTOURIST

Ecotourists are identified as those who are involved with or services within the ecotourism industry. Dependent on their level of involvement, Fennel states that there are hard-path ecotourists and soft-path ecotourists. Hard-paths are dedicated, invested, and typically have some type of professionally-related backgrounds that are applicable to multiple forms of sustainable tourism. Soft-path ecotourists are those who desire to experience ecotourism as a more recreational and casual activity (Fennell 2002).



## TYPES OF ECOTOURISM

The tourism industry has developed substantially over the past several decades. Tourism as a whole is separated into three categories: domestic, inbound, and outbound. Domestic tourism refers to the activities of a visitor within their country of residence and outside of their home (e.g. a US native visiting other parts of the US). Inbound tourism includes the activities of a visitor from their country of residence, to another place within their continent of residence (e.g. a US native visiting Canada). Lastly, outbound tourism includes activities of a resident visitor from outside of their country of residence (e.g. a US native visiting an overseas country) ("Introduction to Tourism" 2019).

Alternative tourism and mass tourism are the two branches of tourism. Alternative tourism involves tourism that revolves around the desire to visit a place where mass tourism is not the primary dynamic and does not focus on the supply and demand of the desired place. (See Figure 2.5)

### ***Agritourism***

Agritourism centers around bringing farming and recreation together. With a theme of education about agriculture and food production, it functions as a type of ecotourism that is also rural tourism. Fennell describes it as: "a generic term that encompasses a whole range of tourism strategies, all of which the purpose is to offer a more benign alternative to conventional mass tourism in certain types of destination" (Fennell 2009).

### ***Scientific Tourism***

A type of tourism focused on visiting a place as a tourist for any scientific-related exploration. It commonly has students involved and tends to take place at universities, museums, laboratories, and many others. This form of tourism is practiced to gain knowledge about the research facilities and the scope of education and/or working for a particular institute or industry (Fahad 2021).

### ***Educational Tourism***

Tourism focused on learning more about the aspects of the visited location and processes to acquire new knowledge about various subjects. (Fahad 2021).

### ***Adventure Tourism***

Tourism centered around adventurous exploration and engaging experience. Participation may include wide range of activities such as sky diving, scuba diving, hiking, trekking, snorkeling, bungee jumping, rafting, rock climbing, and many more. Planned trips are often devised to reach a level of endorphins released or 'rushes' are exercised for enjoyment and excitement (Fahad 2021).

### ***Mountain Tourism***

The World Tourism Organization (UNWTO) considers mountain tourism to be a form that involves high range geographical areas and/or mountainous landscapes and are commonly focused on learning about and photographing flora and fauna of the chosen landscapes (UNWTO n.d.).

### ***Wildlife Tourism***

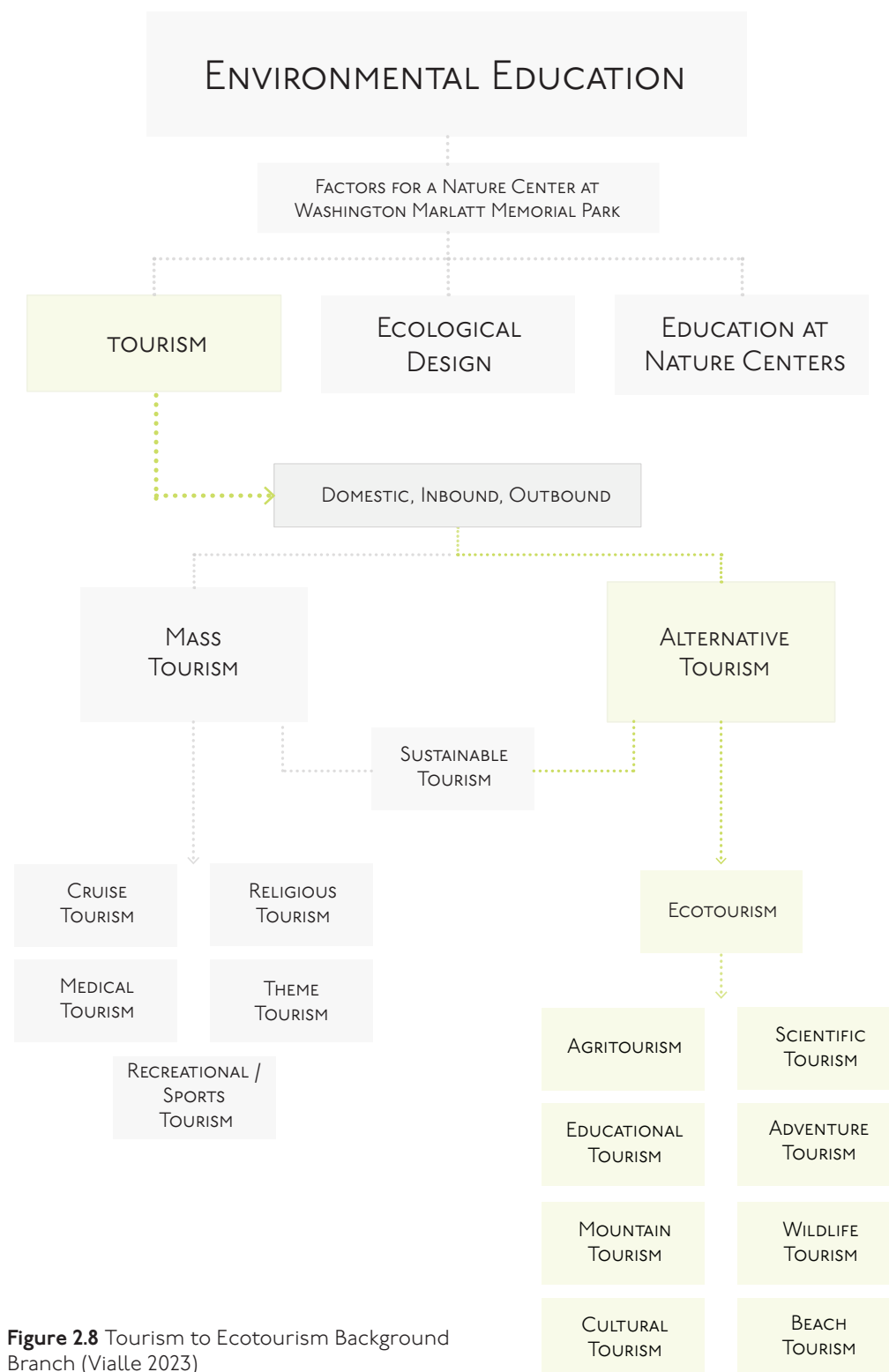
The UNWTO considers wildlife tourism to be a form that involves the viewing of wildlife and the thrill of seeking wild animals, typically in their natural habitat (UNWTO n.d.).

### ***Cultural Tourism***

Tourism focused on searching out and exploring peoples, cultures, and places to learn about different ways that people interact with the places they live (Fahad 2021). Some examples of this include history and art museums.

### ***Beach Tourism***

Tourism that revolves around holidays, spring breaks, and travel with the goal of being near a beach or ocean. Participation in swimming, partying and play are primary activities (The European Market Potential for Sun and Beach Tourism n.d.).



**Figure 2.8** Tourism to Ecotourism Background Branch (Vialle 2023)

## ECOTOURISM VALUES

### 1. Increasing the level of environmental awareness:

"People engaged in ecotourism become more aware and sensitive towards a range of environmental issues such as global warming, deforestation, depletion of natural resources, and this change is going to have positive implications for the future of both, individuals concerned, and the environment" (Ecotourism: Benefits and Value 2014).

### 2. Increasing the levels of cross-cultural knowledge:

"Engagement in ecotourism is going to increase the level of knowledge of tourists about various aspects of local culture and this fact represents a strong point associated with the value of ecotourism" (Ecotourism: Benefits and Value 2014).

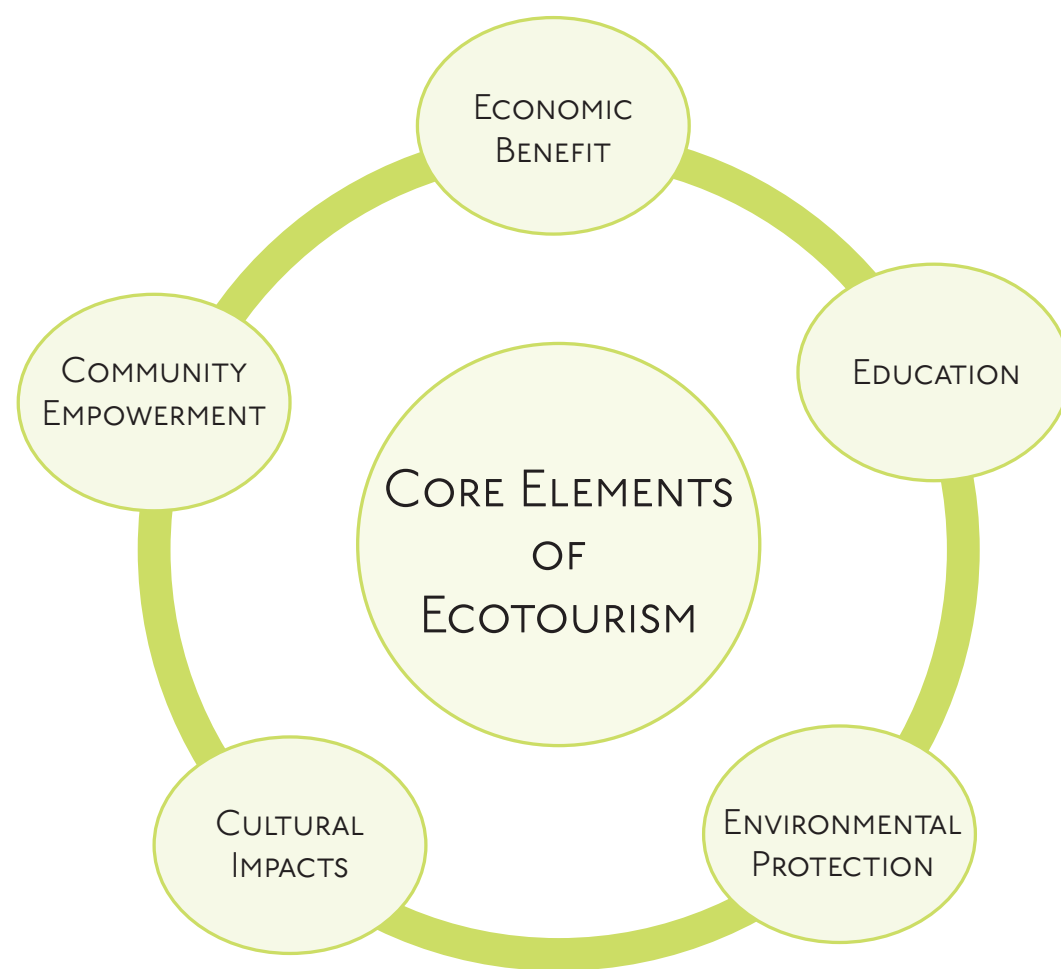
### 3. Preservation of unique tourism destinations for future generations:

"Ecotourism aims to diminish the negative impacts of tourism, and generate positive implications for a destination as a result of tourism activities. This aspect of ecotourism represents substantial value proposition in terms of preservation of unique aspects of tourism destinations of the present and future consumers." (Ecotourism: Benefits and Value 2014).

### 4. Generation of sustainable revenues for tourism destinations:

"Ecotourism can effectively contribute to poverty reduction in local areas through increased level of involvement of local workforce in the provision of ecotourism services, and directing revenues generated through ecotourism fully or partially towards various charitable causes aiming to increase the standards of life for local people" (Ecotourism: Benefits and Value 2014).





**Figure 2.9** Core Elements of Ecotourism (Vialle 2023)

## BENEFITS

Ecotourism supports environmental management and protection as well as the social and cultural traditions surrounding specific communities. In turn, ecotourism reassures that the human-nature connection or natural and/or threatened environments can be benefited through responsible tourism practices and ecosystem conservation tactics.

## ECOTOURISM CONCLUSION

Ecotourism is a growing industry that is guiding the world to a new kind of exploration. Ecotourism is leading travelers to have a more centralized focus of travel with the a main desire being to identify, study, maintain, protect and enhance various naturalized areas. As a type of alternative tourism, the diversity of ecotourism opportunities calls into play the components of nature-based travel, namely 1) the attraction of tourists to special areas, 2) nature-oriented travel with a theme of conservation, 3) making natural areas more accessible, and 4) using tourism as a tool for long-term ecological protection, education, profit, community development, and enjoyment. Ecotourism has been expanding to provide more opportunities for communities and bring awareness of the potential negative impacts that affect tourism within a specific environment.

*(For additional information see Appendix E)*



**Figure 2.10** Konza Prairie Tallgrass View (Vialle 2022)

## ECOLOGICAL DESIGN

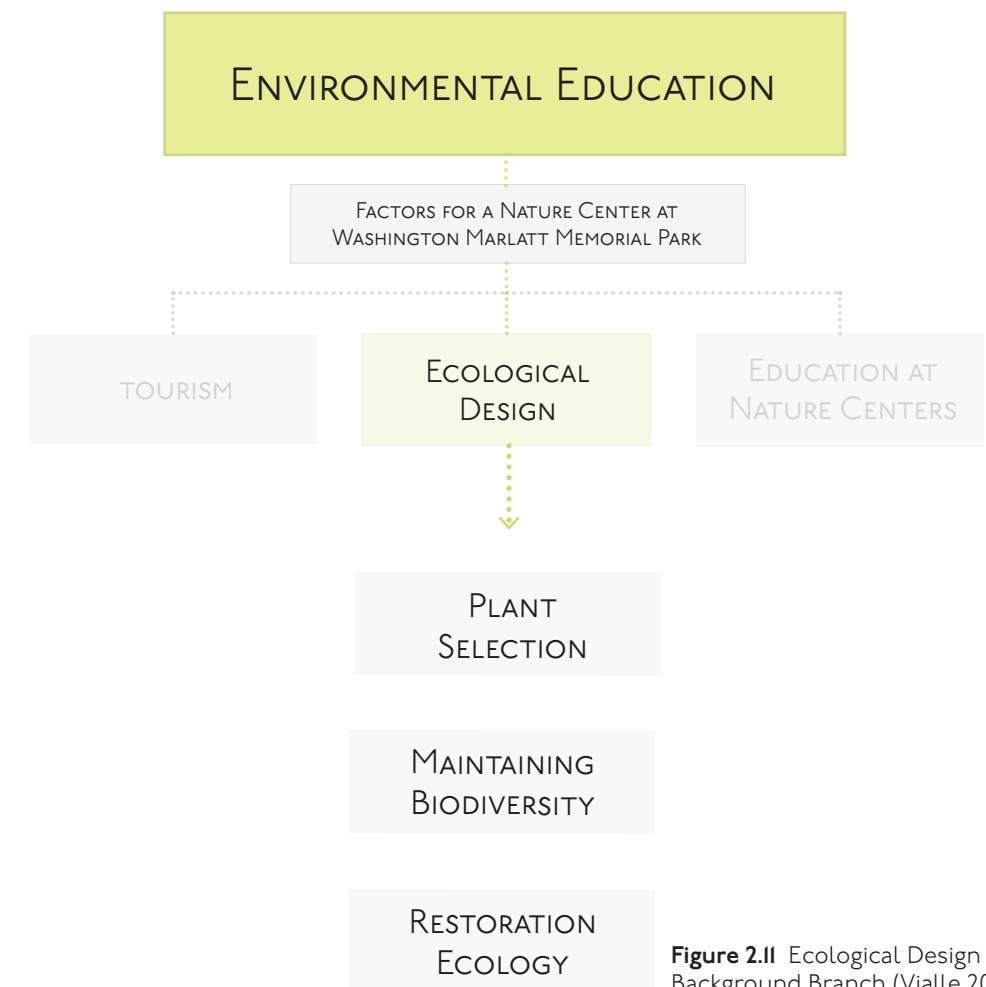
### OVERVIEW

Ecological design is any form of design that helps to minimize environmentally destructive impacts of human, by integrating itself with living processes, patterns, and nature (Sim Van der Ryn et al n.d.). Ecological design informs the design of landscapes that contain natural ecosystems, restoration and conservation projects —focusing on the relationships between human needs and landscape patterns, functions, and dynamics. (Beck 2013).

Designers can learn from ecologists by understanding how different plant communities, animals, and people interact with various ecosystems. Ecological landscape habitat conservation and creation, design seeks to address issues like pollution, stormwater management avoidance and mitigation, and wise resource use. Ecological design merges with sustainability in efforts to sustain life, maintain natural processes, and connect with the surrounding environment.

### PRACTICAL ECOLOGICAL DESIGN QUESTIONS:

- *How can we implement site design and planting design so that new landscapes, ecosystems, and plantings will thrive with a minimum amount of care?*
- *How many different species should we include, and how do we select the appropriate species for a site?*
- *What animals should we try to attract to the site?*
- *In what ways should the project we are designing relate to the ecosystems on the site and what is around the site?*
- *Can the landscapes and environmental education programs we design or envision help us support ecosystem functions, address climate change and biodiversity loss, while meeting human needs and interests?*



**Figure 2.11** Ecological Design Background Branch (Vialle 2022)



## ECOLOGICAL DESIGN AND PLANT SELECTION

### ***1. Choose plants that are adapted to the local environment:***

With plants being one of the primary components of an ecosystem, the need for native plant selection according to biogeography helps make conditions for environments more suitable. Hardiness zone is the progression of zones based upon climate and helps determine the success of different native species being planted in specific areas. The selection of plant species that are able to adapt based on temperature and available water in an area is a significant part of forming an ecological landscape (Beck 2013).

### ***2. Use biomes to help define the character of a region's vegetation and the ecosystems we should conserve during the process of site design:***

Biomes are a defining characteristic of how plant species are classified. The “geography of plants” otherwise known as phytogeography is the distribution of how plants and animals are identified. With varying temperature and levels of precipitation, it helps determine what plants are most suitable for certain conditions (Beck 2013).

### ***3. Design different landscapes for distinct ecosystems, seasonal cycles, and larger biomes:***

With support of landscape ecology, an ecological landscape can respond to the environmental conditions of the biome in which it resides. Monthly climate and seasonality also play a key role in determining the success range of plant adaptation. This involves looking at humidity levels, precipitation, and temperature fluctuation, to help develop the character of the biome (Beck 2013). Design changes should reflect the plants, communities, and seasonality, to help lead to less maintenance. This also leads to a better environment to provide habitats for any local wildlife (Beck 2013).

### ***4. Create seasonal interest by showcasing plant adaptation:***

One of the goals of a designer is to create year-round interest for a selected site or landscape. An ecological landscape strives to integrate seasonal planting elements and also to recognize the changes in the environment. This leads to other considerations such as plant selection and there for goals for reducing maintenance demands (Beck 2013).

### ***5. Manage the built according to microclimate:***

Certain elements of landscape have built elements that play a large role within the natural features of a landscape. Patterns of the sun and the growth of plants are factors that influence how vegetation grows and interacts with the built environment. Materiality, overhead elements, and impermeable surfaces have significant effects on temperatures and infiltration water water into soils and are important aspects to consider when designing (Beck 2013).

### ***6. Use local and non-local ecotypes within ecological landscape systems:***

The use of local (native) and well-adapted, non-invasive non-local plant species is a key part of growing the environment of interest. Planting in an ecological landscape involves finding plants that will adapt well to the specific, dynamic conditions of the site, even if they are considered non-local (Beck 2013).

Designing for an ecological landscape involves making decisions about ways of maintaining harmony with the selected environment. Using plant communities that can adapt is a way to keep the intrinsic socio-ecological character of an area that is being designed. Looking past the sculptural or visual qualities of a how plants look can allow for sustainable growth of a ecological landscape. By being mindful of plant selection and considering compatibility with people and place, a successful ecological design can be achieved (Beck 2013).

## DESIGNING AND MAINTAINING BIODIVERSITY

Designing according to the designer's perspective focuses on creating interest in biodiversity through the process of conservation. Ecologists also focus on diversity through species distribution and overall focus on forming a resilient and diverse ecological community. The functionality of an ecosystem thrives on being able to perform multiple functions in a specific area, and overall is more effective when these functions are maintained and remain stable. Biodiversity is an important factor for designers to consider based on the preservation of natural systems, the influence of various interacting communities, and the understanding of how each ecosystem functions (Beck 2013).

## FACTORS FOR MAINTAINING A HIGH-FUNCTIONING LANDSCAPE

### ***1. Design the built environment to support biodiversity:***

Designing according to biodiversity and the built environment, there are ways of using the built structures as an advantage for increasing biodiversity. Even though many ecosystems undergo stress due buildings and pavement, these features can help maintain and improve the levels of biodiversity in an ecosystem by concentrating solar radiation and moisture in some areas and providing shade in other locations. Designs can help protect regional biodiversity through natural-systems-focused vegetation maintenance, conservation of landscape functions, and helping bring back native species where previously lost (Beck 2013).

### ***2. Invasive species threaten biodiversity:***

Invasive species have a large impact on natural systems and need to be wisely managed. "Invasive species can disrupt the functioning of native ecosystems" (Beck 2013 III).

### ***3. Biodiversity supports ecosystems:***

The greater the diversity of plants the more pollinators and different root structures will be available to adapt to changing conditions (Beck 2013).

### ***4. Create diverse ecosystems:***

Creating diverse landscapes is a positive process to bringing a location back to a productive ecosystem. The process of recreating, restoring or replacing a disturbed and simplified area to provide diverse species can lead it back to a successful and functional ecosystem (Beck 2013).

### ***5. The functionality of biodiversity is more important than the number of species:***

"Biodiversity is not just a matter of the number of species in a community. The truly important measure, that ecologists have realized, is diversity of functional traits" (Beck 2013, 118). By increasing the amount of diverse functions an ecosystem can become a more productive, successful community (Beck 2013).

### ***6. Increase stability with a greater diversity:***

Designers have seen that creating a plant community with a functional ecology can be difficult to maintain without the proper measures of adaptability and stability. "The designer's art in diverse communities is not to set the exact proportions and blends of different plants but to create a mix of plants that can respond dynamically to changing conditions" (Beck, 2013, 123).

## RESTORATION ECOLOGY

Restoration ecology is the process of applying scientific study to support the practices of ecological restoration. This is a practice of renewing and restoring damaged and/or degraded ecosystems (Beck 2013). It applies the science of ecology focusing on an ecological system and restorative area. Restoration efforts have the capability to bring science to design in hopes to effectively improve the ecological state of an ecosystem while also assisting with maintenance of these systems through time. The process of restoring an ecosystem or habitat using ecological restoration involves providing benefits to a degraded areas and reversing the damage done by human interaction (Beck 2013).





**Figure 2.12** Ecological Design Expression (Vialle 2023) Adapted From: (Beck 2013, 239)

## CONCLUSION

The process of ecological restoration and maintaining diversity in ecosystems is undermined when biodiversity is diminished. Invasive species and to habitat destruction are two primary factors leading to the loss of biodiversity. By maintaining a mindset that focuses on the use of beneficial species and control of invasive ones, a successful restoration of landscapes ecosystems can be achieved. By building landscapes that embody the natural environment, a multi-functional ecosystem can be created while enhancing biodiversity (Beck 2013).

## SUSTAINABILITY

### OVERVIEW

An important factor of design is the aspect of sustainability. In current design practice, sustainability is known as “managing resources in a manner that provides for current necessity while not compromising the needs of the future” (US EPA 2013). With the previously discussed topics of ecotourism and nature-based tourism, the design concept of sustainable tourism came to guide this project.

Sustainable tourism is defined as:

***“Tourism that is economically viable, but does not does destroy the resources on which the future of tourism will depend, notably the physical environment, and the social fabric of the host community” (Honey 2008, 235).***

### FACTORS OF SUSTAINABLE TOURISM

Sustainability plays a key role in any design for a restored and natural area. With ecotourism being a primary focus related to this report, there are a few key factors that have been identified in relation to sustainable tourism. The first is to protect the vitality of the environment, namely natural ecosystems and wildlife. Secondly, is to conserve any existing cultural heritage to enhance tourism experiences. Next is to provide socio-economical benefits for the local community. Lastly, is to create inclusive and accessible tourism programming and opportunities.

### APPLICATION TO WASHINGTON MARLATT MEMORIAL PARK

Washington Marlatt Memorial Park has a history of restorative and nature-based exploration. More people of different ages and abilities can enjoy and learn from the ecosystems at Marlatt Park if facilities are created that allow for universal access for at least some of the park.

## EDUCATION AT NATURE CENTERS

### OVERVIEW

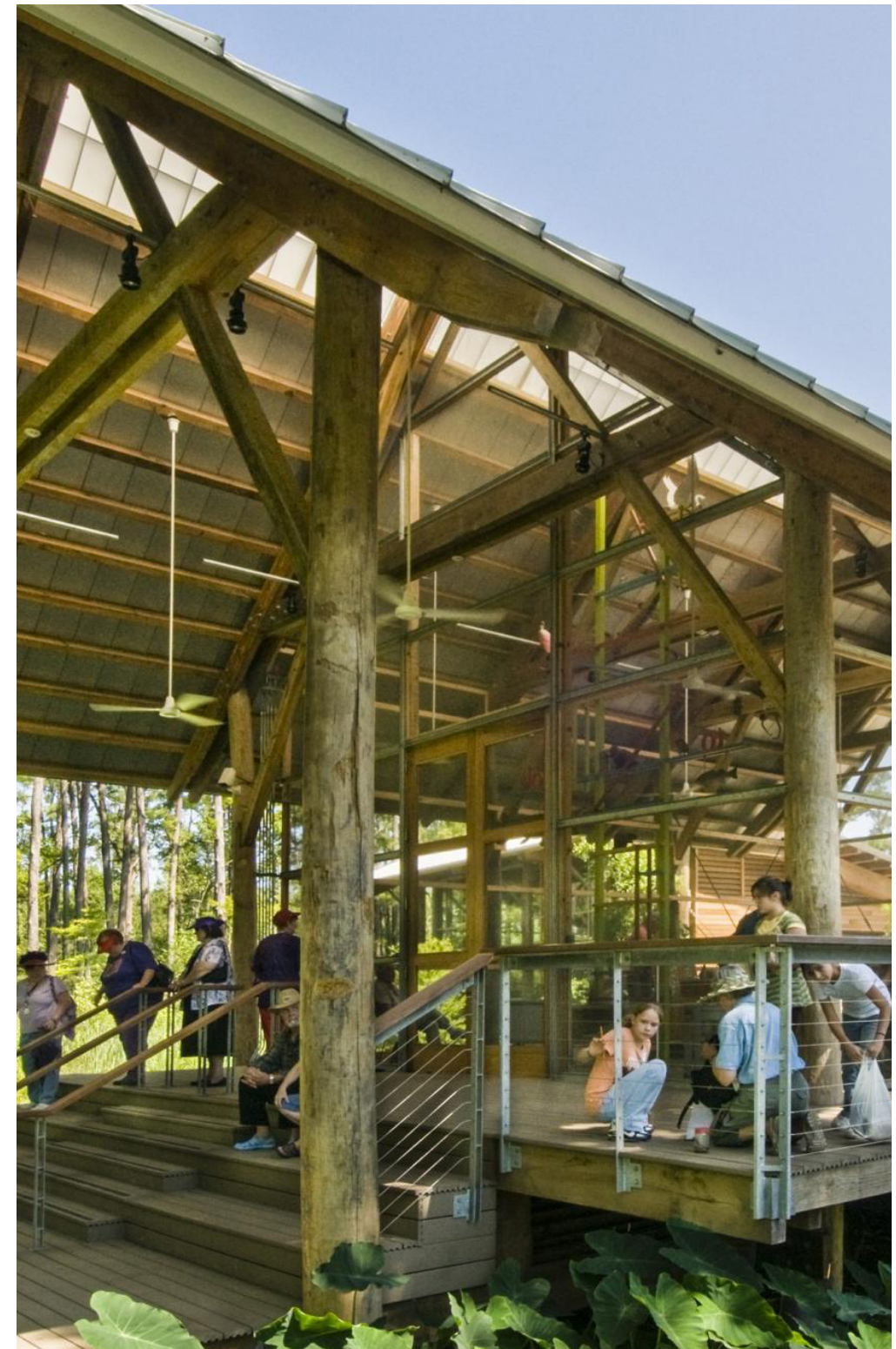
The relationship between ecotourism and education is very important and highly beneficial to enhancing the human-nature connection. Educational programming and nature centers allow people to have a place for immersive learning and opportunities for interaction with their surrounding landscape. Education not only allows for learning but helps lead people to experience their surrounding landscapes with the principles of appreciation, respect, interpretation, comprehension, and stimulation. With these ideals of education and ecotourism, it provides significant opportunities for community engagement and personal growth (Urias et al. 2009).

According to the National Association for Interpretation (NAI) a nature center is defined as:

***“a facility that brings environments and people together under the guidance of trained professionals to experience and develop relationships with nature. A nature center serves its community and fosters sustainable connections between people and their environment.” (NAI 2007).***

### IMPORTANCE

Some argue that in today's world, there is a disconnect between people and the natural world, stemming from the increased alienation from healthy ecosystems and open space (Browning et al. 2016). With a network of over 1800 nature centers across the United States, these places provide the chance for new opportunities to promote community engagement and strengthen the bond between people and their regional, local, and nearby landscapes.



**Figure 2.13** Shangri La Nature Center (Lake Flato n.d.)



Nature centers can be diverse, supportive and beneficial when it comes to serving as places for cultivating awareness and education on certain kinds of environments. Nature centers typically have similar common goals when it comes to functionality. They usually focus on the themes of education, science, habitat protection, and resource conservation (Browning et al. 2016). Nature centers thrive on community engagement, environmental awareness and programming for portraying knowledge on topics that are either under discussed or lack incentive to be studied. Programming implemented into nature centers allows for structured learning opportunities and development of other ecotourism opportunities. Washington Marlatt Memorial Park currently has a lack of education-focused programming and no nature center.

Overall, nature centers help local residents, visitors, and ecotourists learn about their environments and build a strong human-nature connection. Due to nature centers focusing on the human-nature connection, providing a nature center in a unique, diverse, and historically rich environment would give this part of the Flint Hills a place for people to recognize and appreciate its beauty with direct, hands-on learning. By establishing a successful nature center, WMMP would offer visitors a memorable experience which should result in increased awareness and appreciation. Various groups including, but not limited to children, schools, adults, and local residents would have a place to learn, relax, explore and transform their visits a site into a beneficial and effective environmental experience accessible to all.

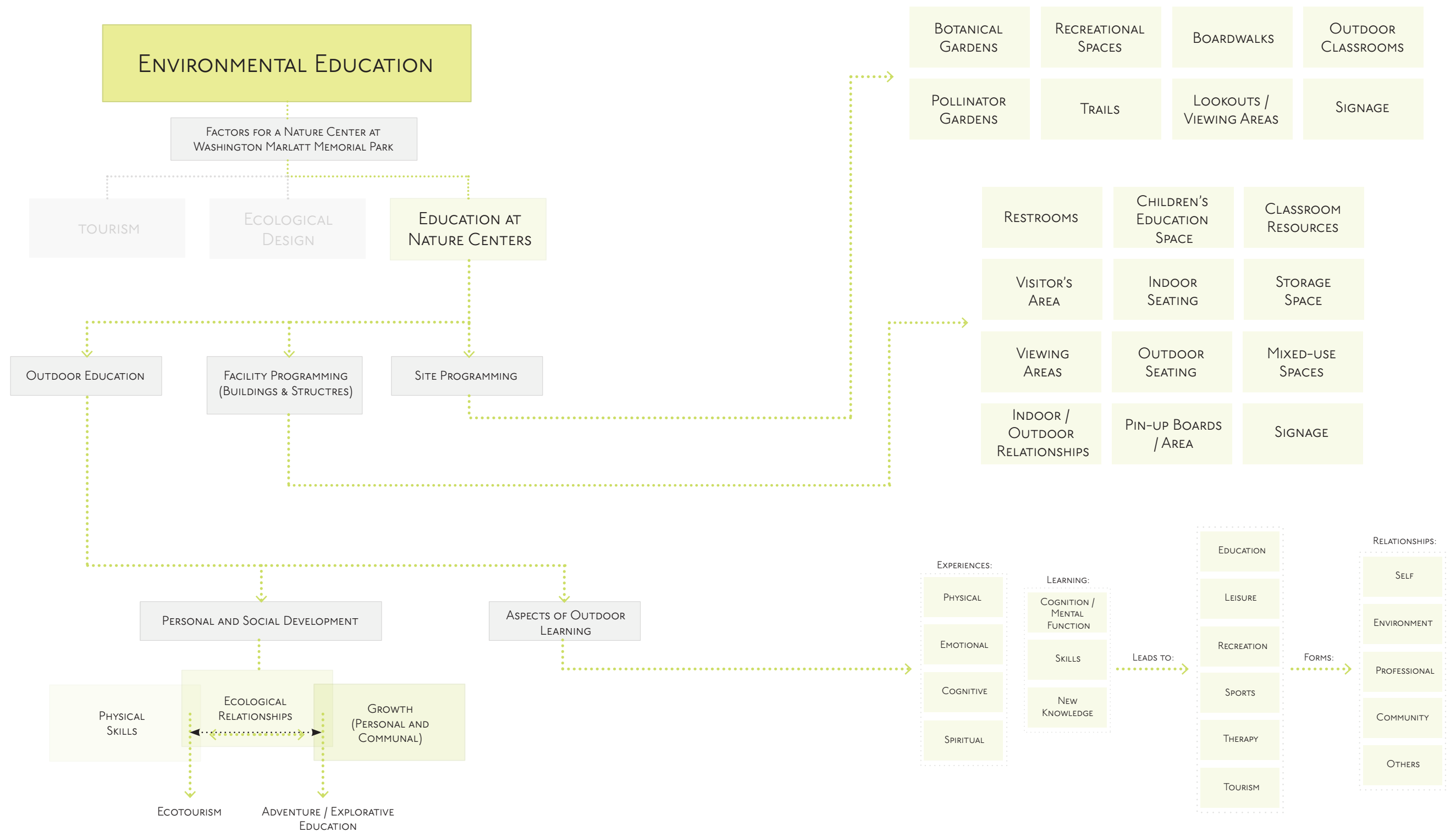
Design opportunities for environmental education and ecotourism programming will help form a place for establishing human-nature connections. When nature centers are established, there can be difficulty maintaining the interest and awareness of the necessities for successful long-term operations and management. Thus, excellent, engaging, and evolving programming and integration with schools and groups such as scouts and birding groups and will be needed.

***“A nature center is more than a place - a physical structure with surrounding land area. It is an event, a potential experience for a member of the community.”***

***These relationships...“have the potential to be powerful motivators for connecting people to nature in ways few other institutions can.”***

***(Browning et al. 2016)***

Browning and other authors (2016) have discussed the importance of establishing recognition to help achieve successful program implementation. They talk about how some facilities (i.e. nature centers) require an abundance of resources to properly enact effective programming and promote environmental stewardship (Browning et al. 2016). Depending on how and what forms of programming are established, upkeep and management can be a struggle, especially in areas where structural resources and utilities are sparse, and the availability for volunteer management is low. It is crucial to design according to the selected site and institutional management capacities of those who will operate the nature center to help effectively established programming and benefit any other ecotourism opportunities. With most of the Flint Hills already providing a flexible and explorative site, a nature center that is either privately or publicly owned and well-funded can serve as an effective facility to promote the human-nature connection and educational opportunities. Figure 2.14 highlights the range of opportunities that exist for education at a nature center.



**Figure 2.14** Education at Nature Centers Background Branch (Vialle 2023)



## REGIONAL CONTEXT: THE FLINT HILLS ECOREGION

### OVERVIEW

The Flint Hills Ecoregion is a beautiful and widespread region. It is a unique and diverse tallgrass prairie native to Central North America but now substantially reduced in extent and primarily found within Kansas. Filled with beautiful and resilient native grasses and wildflowers, it is known for its lush growth, fire-management practices, and cattle grazing. The tallgrass prairie contains deep and shallow soils along with a diverse geology. With shallow soils and an historical inland seaway geology, this Flint Hills prairie has a layered limestone and shale base with sloping topography. With steep slopes and stepped surfaces, the land has been used for grazing with an emphasis on grassland preservation. The tallgrass prairie contains cultivation potential along rivers and streams but the steep slopes erosion makes cultivation difficult.

### CHARACTERISTICS

The Flint Hills have changed over thousands of years, evolving diverse ecosystem. This region has a very unique aesthetic along with a rich history. This rich cultural history of the Flint Hills Ecoregion has adapted and changed based on various groups of people and cultures. The Flint Hills has several iconic features, including rolling hills, cuerdas, and rocky soils with sediment-laden valleys. With trails and tallgrass as the primary dynamic of exploration, the Flint Hills has a strong human-nature connection.

The following section discusses the national context, history, climate, topography, geology, soils, vegetation, culture, hydrology, and fauna.

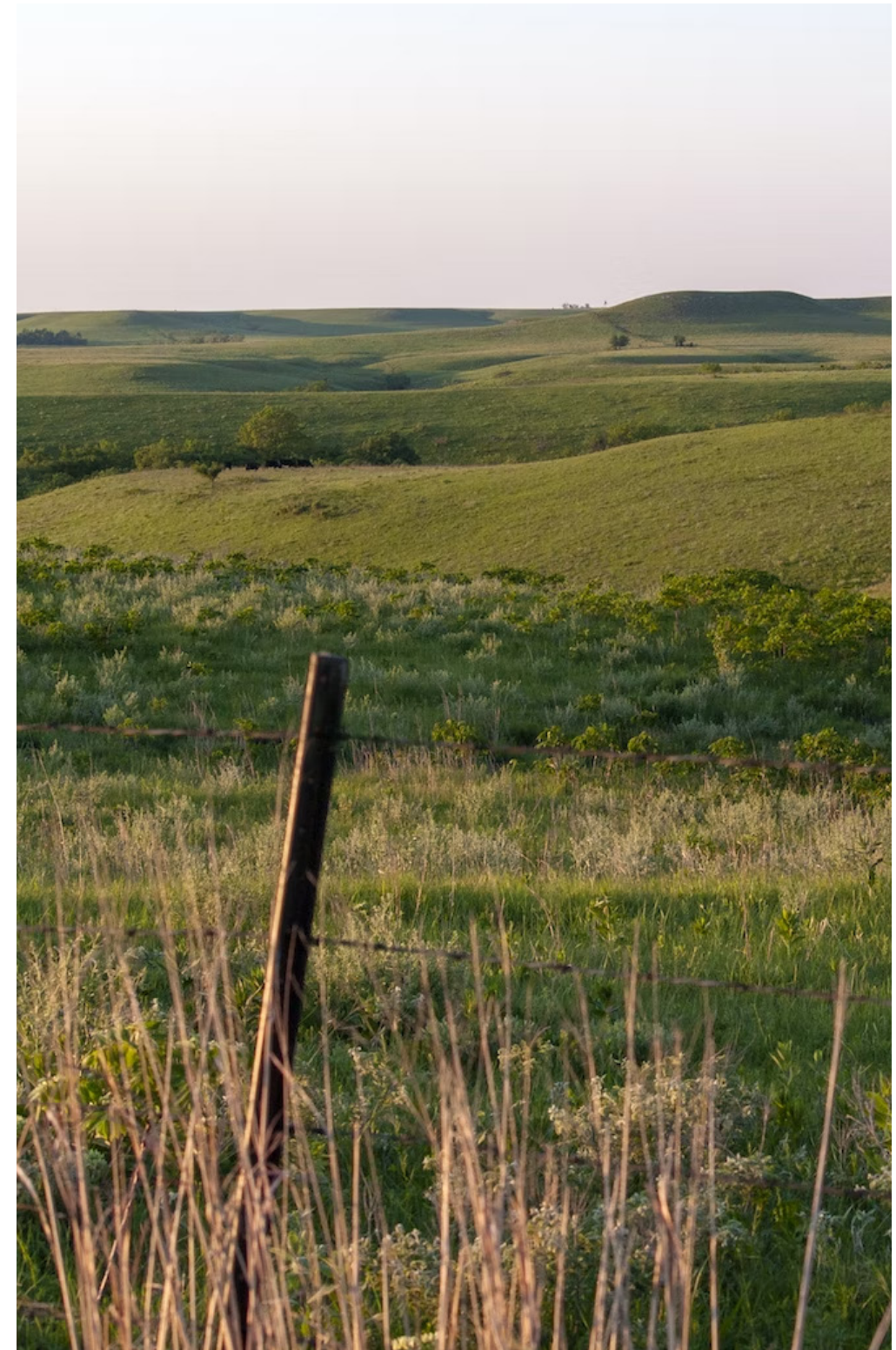
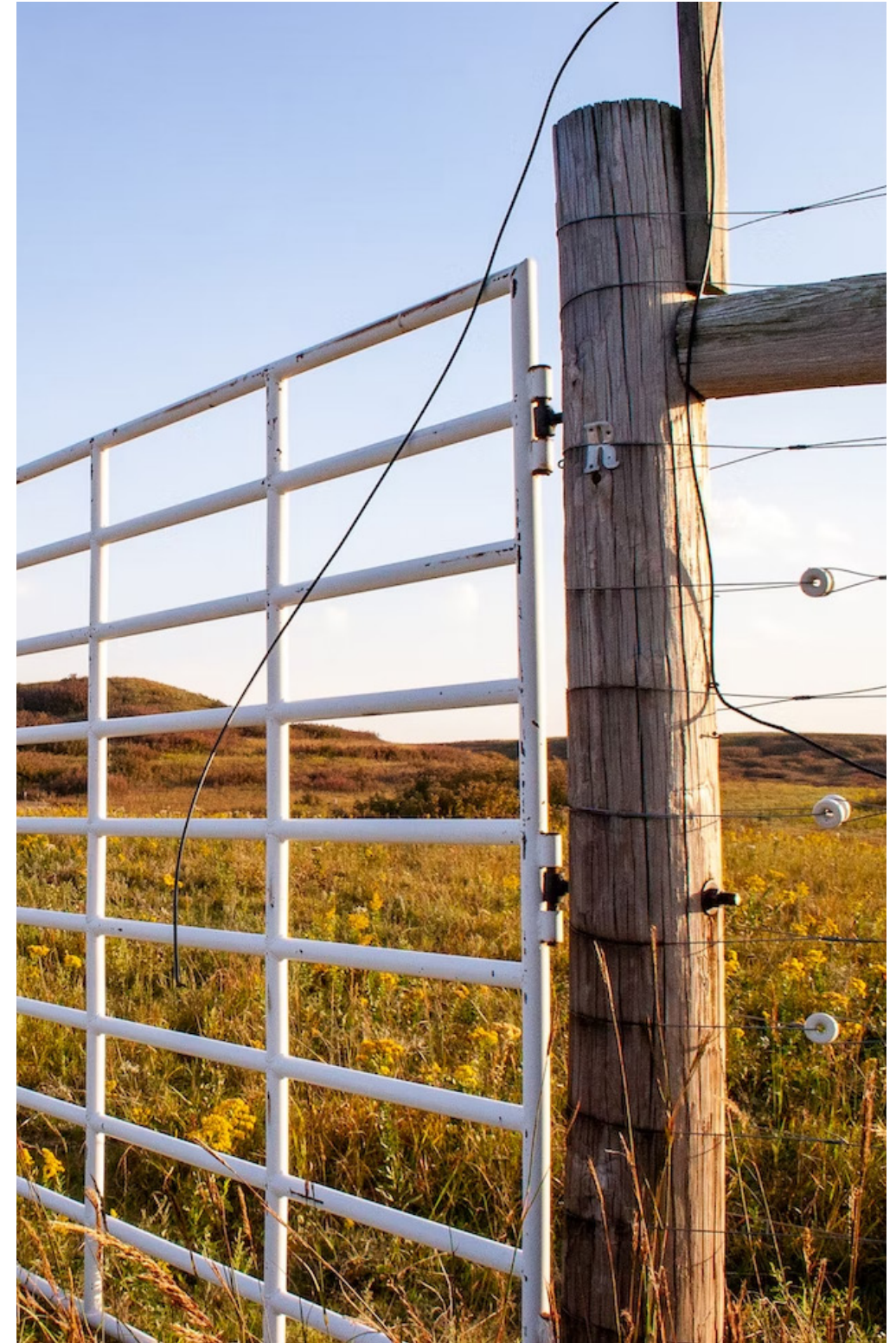


Figure 2.15 Kansas Rangeland (Hammel 2020)





**Figure 2.16** Washington Marlatt Memorial Park Cuesta (Skabelund 2006)



**Figure 2.17** Konza Prairie Fence (Hammel 2020)



HISTORY OF THE TALLGRASS PRAIRIE

The history of the Flint Hills Ecoregion is unique and diverse. Located within the Great Plains Region of the United States, The Flint Hills makes up just over 1.6 million hectares of native tallgrass prairie (Kansas State University, 2022). (See Figure 2.18 Historic Range of The Tallgrass Prairie).

Going back, indigenous people established themselves in the prairie. “By the time of contact with European explorers in the mid-1500s, the Pawnee, Wichita, Osage, and Kansas had already established flourishing grassland cultures, becoming quite familiar with the tallgrass prairie and the ways necessary to succeed on it. Many of these adaptations would influence incoming American settlers, as well as present-day Flint Hills residents, helping to establish living connections to the past” (NPS 2021).



Figure 2.18 Historic Range of The Tallgrass Prairie (Vialle 2023)

CLIMATE

This region has a unique and fluctuating climate. Being in a central or “landlocked” area, the Flint Hills, climate changes frequently on a yearly, daily or even hourly basis. (Flint Hills Climate, 2022). “Because the Flint Hills are centrally located, it also dictates the fact that our region is dominated by grasses. These native graminoids have the ability to respond to extreme changes in climate; specifically, they can survive drought when necessary but then quickly take advantage of rain during seasonal showers. Their dense, fibrous root systems make them uniquely qualified to rapidly and efficiently absorb rain before it has a chance to sink down past their roots and contribute to groundwater” (Flint Hills Climate 2022).

|                           | Jan  | Feb  | Mar  | Apr  | May  | Jun  |
|---------------------------|------|------|------|------|------|------|
| Average high in °F        | 41   | 47   | 57   | 67   | 77   | 86   |
| Average low in °F         | 17   | 21   | 30   | 42   | 54   | 63   |
| Av. precipitation in inch | 0.63 | 1.08 | 2.49 | 3.17 | 5.09 | 5.70 |
| Av. snowfall in inch      | 5    | 4    | 2    | 0    | 0    | 0    |

|                           | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|---------------------------|------|------|------|------|------|------|
| Average high in °F        | 92   | 90   | 82   | 70   | 55   | 42   |
| Average low in °F         | 68   | 66   | 56   | 43   | 31   | 20   |
| Av. precipitation in inch | 4.42 | 4.12 | 3.43 | 2.69 | 1.73 | 1.07 |
| Av. snowfall in inch      | 0    | 0    | 0    | 0    | 1    | 5    |

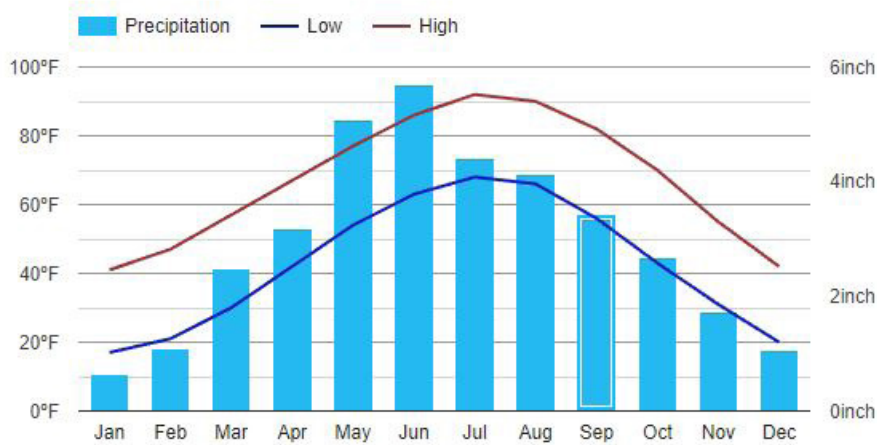


Figure 2.19 Manhattan Climate Charts (US Climate Data 2023)



## TOPOGRAPHY

### **Grazing**

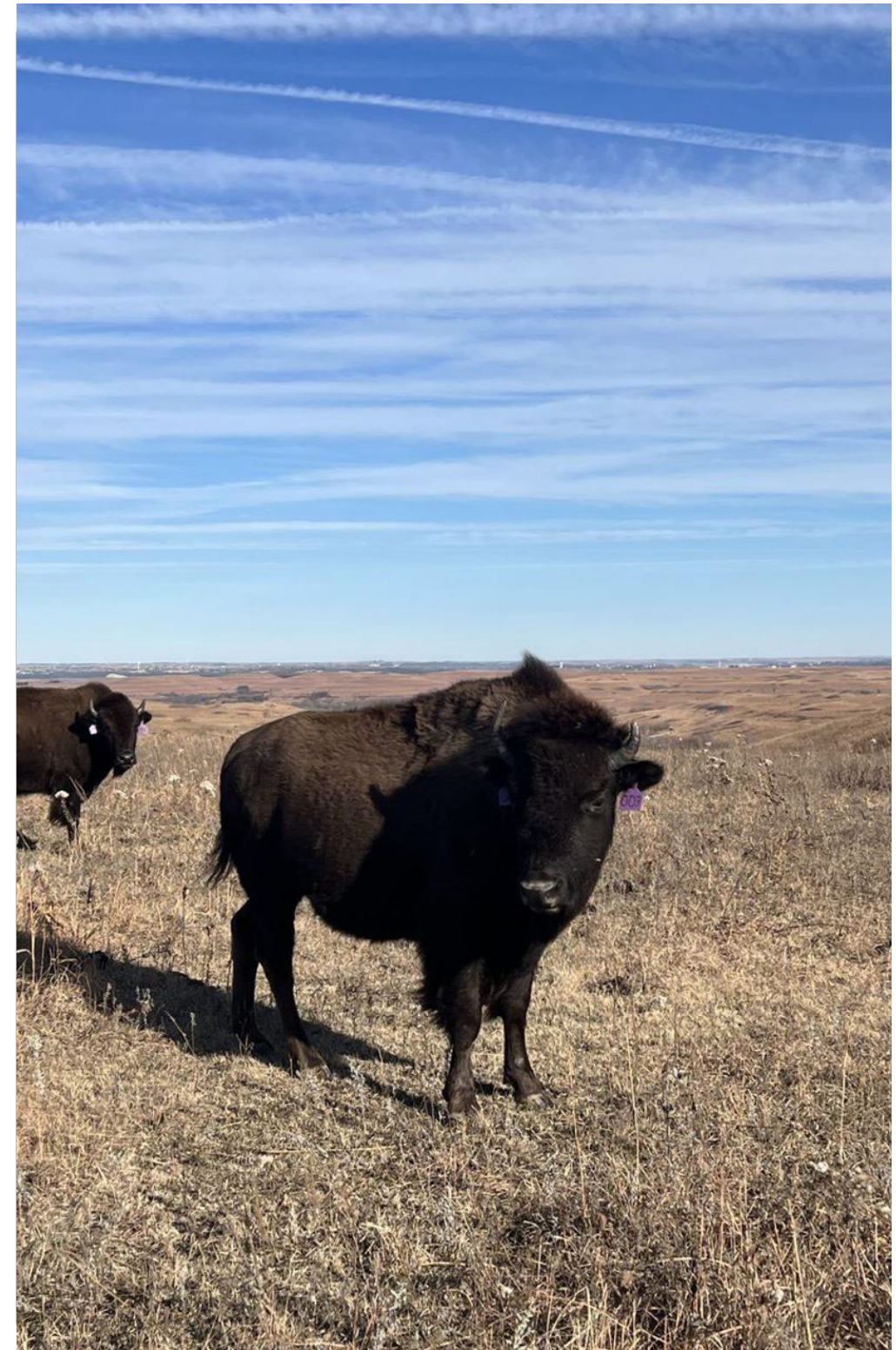
The Flint Hills Ecoregion has been known for its native grazers for thousands of years. Historically, it has been a reliable and effective area for cattle grazing along with bison, which are the dominant grazer prior to European settlement. Due to the abundance of pasture and rolling hills, cattle are placed throughout the rangeland of the Flint Hills, then during the spring and are later removed in the fall. (KSU 2016). Grazing is also influenced by the fire management to help increase grass productivity resulting in greater cattle weight gain.

### **Cuestas**

The Flint Hills Ecoregion is known for the iconic rolling landforms known as cuestas. Cuestas are the slopes that can be steep on one or more sides and flatter near the top (NPS n.d.). Prairie-covered cuestas provide the Flint Hills with a beautiful and unique character.



**Figure 2.20** Former Bison Wallow at Marlatt Park (Skabelund 2006)



**Figure 2.21** Konza Prairie Bison (Vialle 2022)



## GEOLOGY

The Flint Hills geology is defined by its limestone outcrops, thin soils, and shale that contains vegetation ancient and decomposed. There is a presence of deep-cut valleys with exposed geology that is beneath the soil. “The thin, rocky soils and steep slopes of the Flint Hills limited crop cultivation to river and stream bottoms. These rare bottom-land prairie areas are covered by a layer of river-deposited sediments that have developed thick soils that are especially valuable for cultivation” (NPS 2021).

There is also a factor of fossils that are from that past, which are marine invertebrate (animals without backbones) including coral, clams, snails, sea urchins, bryozoans (colonies of animals that are similar to sea fans), and other clam-like brachiopods (NPS (C) 2021). Many are present in the limestone and can be seen in materials used for structures and any exposed or cut limestone.



**Figure 2.22** Marlatt Park Topographical & Geological View along K-II3 (Skabelund 2006)



**Figure 2.23** Soil Profile West of Marlatt Park (Vialle 2023)  
Adapted from a 2006 photo taken by Lee Skabelund



## VEGETATION

The Flint Hills is made up of four dominant grasses in addition to many other species. The four dominant grasses include Big Bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), Little Bluestem (*Schizachyrium scoparium*), and Switchgrass (*Panicum virgatum*). “Nearly 75% of the grasses growing in the Kansas Flint Hills are one or more of these four species. However, over 70 different species of grass have been identified in the Kansas Flint Hills region” (NPS (B) 2021). There are also hundreds of species of native wildflowers (Kansas Wildflowers and Grasses 2023 -- [www.kswildflower.org/](http://www.kswildflower.org/)). Each of these plant species have their own unique above- and below-ground structure.

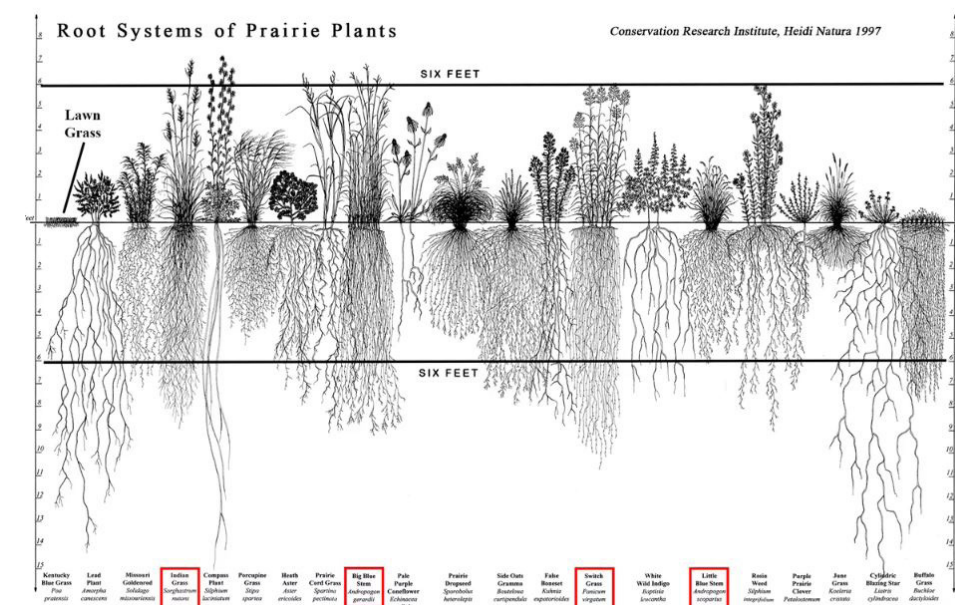


Figure 2.24 Root Systems of Prairie Plants (NPS 2021)

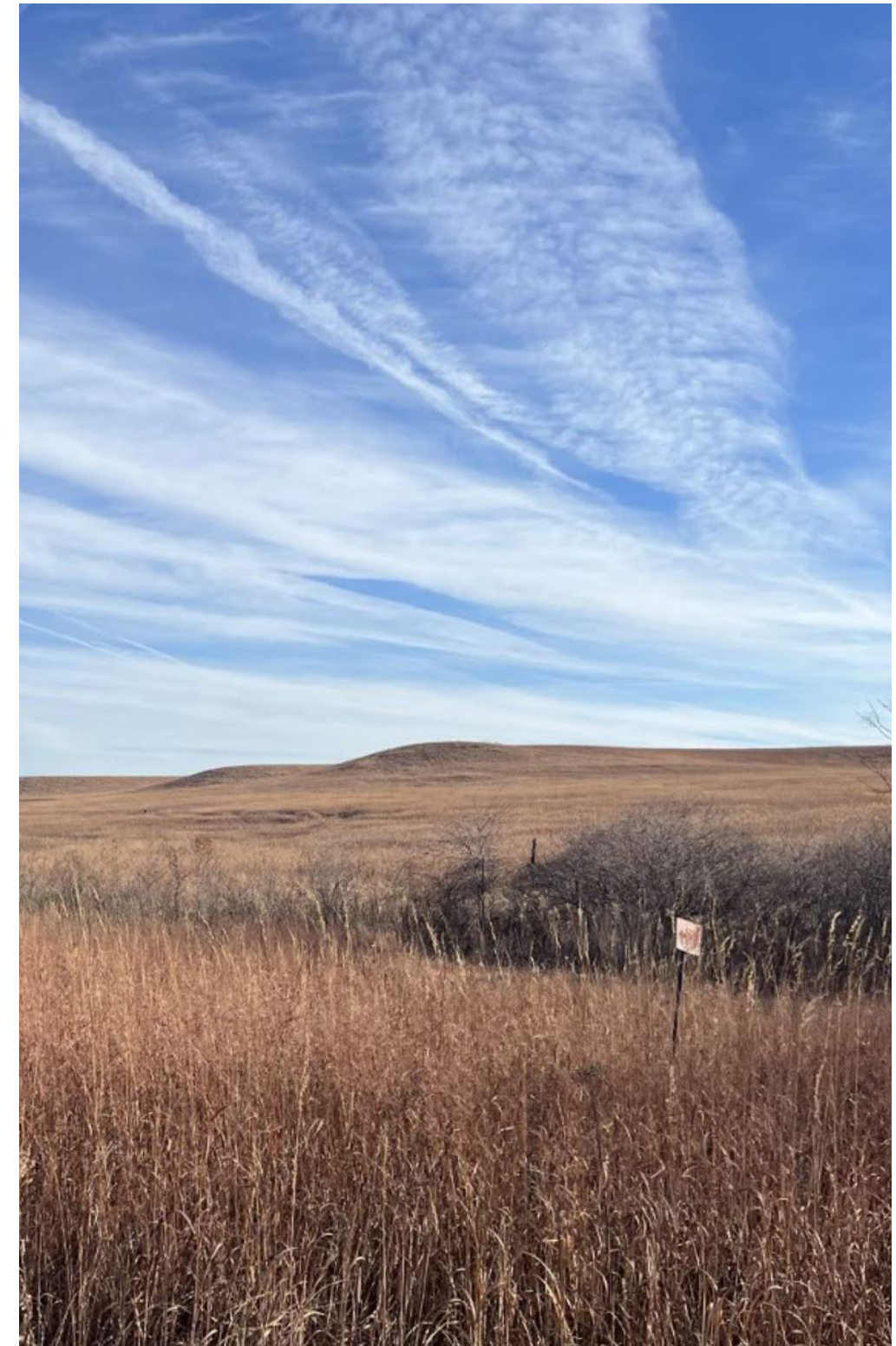


Figure 2.25 Konza Prairie Rolling Hills (Vialle 2022)



## CULTURE

The culture of the Flint Hills involves many different functions and practices revolving around the management and maintenance of the tallgrass prairie. With the tallgrass prairie being a highly disturbance-dependent ecosystem, there are practices such as grazing and prescribed burning that need to be exercised regularly to help support the ecosystem.

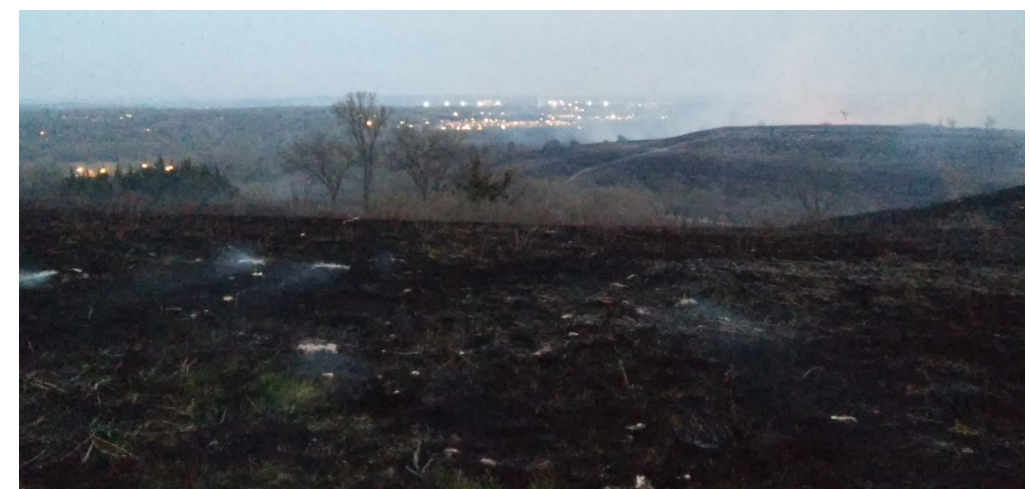


**Figure 2.26** Burn Management South of Anneberg Park (Skabelund 2006)

### ***Burn Management***

One of the most prominent and well-known practices to manage tallgrass prairie is burn management. This fire-induced regime is performed to help manage the grass species and their productivity of growth. Fire affects grazing depending on the frequency and intensity of the burn. Burning usually occurs on a yearly basis (Robertson et al 2022).

Vegetation is controlled through this burning process that helps shift the mosaic of plant communities toward tallgrass prairie ecosystems of various types—from low-lying wet meadows to xeric (very dry) prairie slopes and ridgelines throughout the prairie. It also helps control the expansion of woody species, which helps to maintain the prairie.



**Figure 2.27** Post-Burning Images near Marlatt Park (Skabelund, 2006)



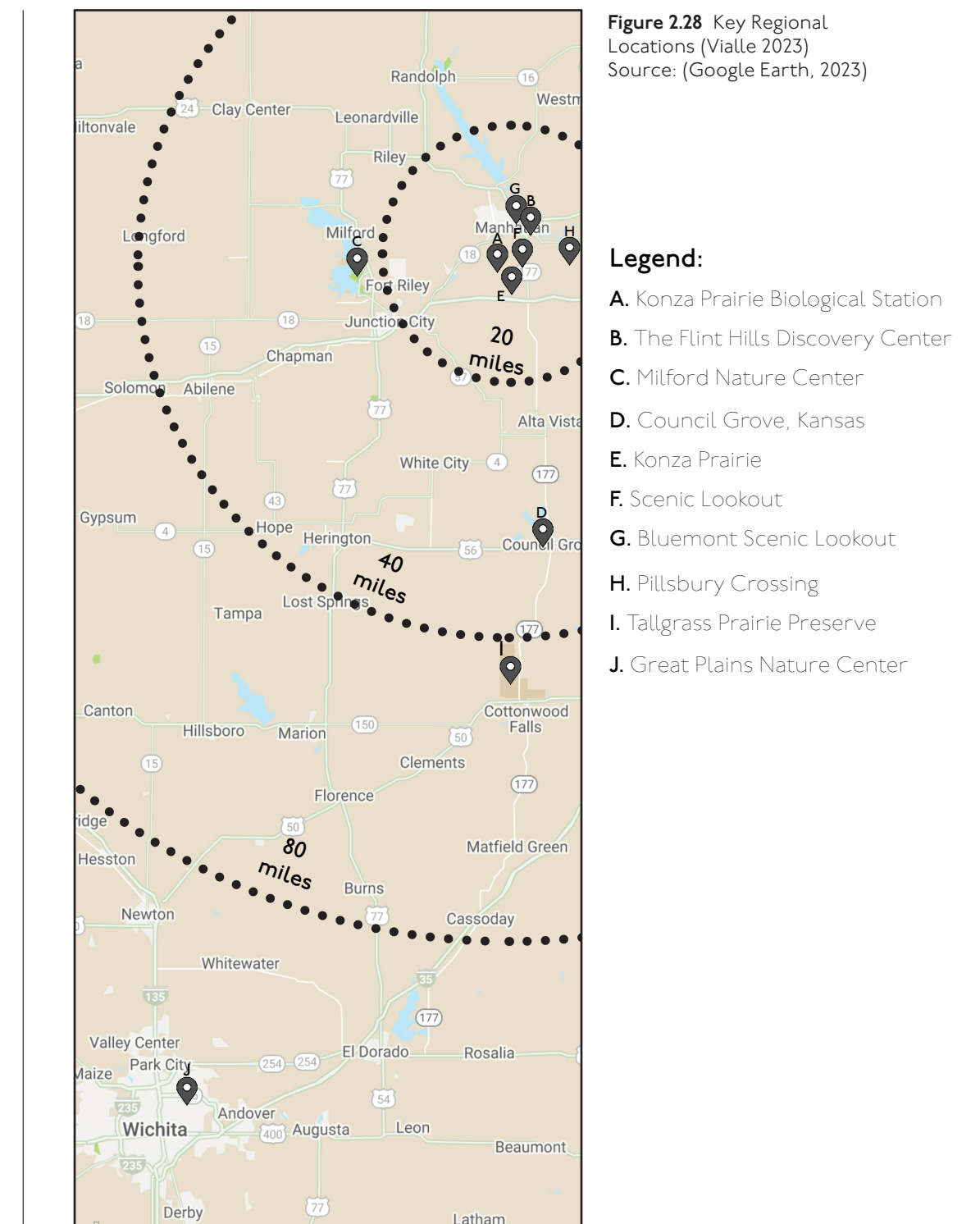
## KEY LOCATIONS

Key locations for relevance of programming and opportunities have been identified based on location and applicability to the selected site. These locations have been identified to help lead and inspire the projective design for the selected site. These selected locations are within the Flint Hills Ecoregion in addition to any site that pertains to ecotourism programming, environmental education programming, and nature centers. The locations begin with local attractions within Manhattan such as the scenic lookout along K-177 and the Konza Prairie Biological Station. These locations serve as significant ecotourism programming through the use of trails for exploration, educational activities, and otherwise experiencing or learning about the unique characteristics of the Flint Hills Ecoregion.

### **Konza Prairie Biological Station**

The Konza Prairie Biological Station is a local field laboratory managed by the KSU Division of Biology, on behalf of The Nature Conservancy. Scientists working at the Konza Prairie study the tallgrass prairie and also help with the management practices. Management practices include burning, cattle and bison grazing, and trail and facility maintenance. They provide a successful blend of grassland research and exploration and provide opportunities for learning from the prairie, due to environmental education being a vital part of Konza prairie operations.

The KPBS has a three-fold mission of research has the missions of research, prairie conservation and education with programs of research open to scientists and students. The Konza Prairie is considered a Long-Term Ecological Research (LTER) site that centers its comprehensive research on long term ecological studies. They have three main areas of research emphasis, which include the effects of burn frequency, climatic variability, and grazing on the ecology of the tallgrass prairie. These studies have many other areas like abiotic drivers (climate and fire) and biotic drivers (herbivory, competition, mutualism, and predation). All of these factors of study are to help advance the ecological research and better understand the structures and dynamic of the tallgrass prairie (Konza Prairie LTER 2021).





### ***Council Grove, Kansas***

Council Grove, Kansas is a small town that is at the intersection of Highway 56 and K-177. The town has a meaningful history related to the Flint Hills and traveling west. It is home to the Santa Fe Trail and many other available sites and trails to visit.

### ***The Flint Hills Discovery Center***

The Flint Hills Discovery Center is a local museum that provides programs, exhibits and opportunities for education on the Flint Hills. It holds interactive exhibits, children's programs, and serves as venue space that can be rented out for several kinds of events. Many of their programs and activities involve learning about the aspects of the Flint Hills, such as geology, soil, fossils, and vegetation. By having interactive educational programming, the Discovery Center gives users a chance to learn about the Flint Hills Ecoregion more effectively.

### ***Milford Nature Center***

The Milford Nature Center is a facility along the Milford Reservoir which is within the Flint Hills. It allows visitors to learn about animals, vegetation, and aspects of the Flint Hills prairie and natural communities of Kansas.

### ***Scenic Overlooks***

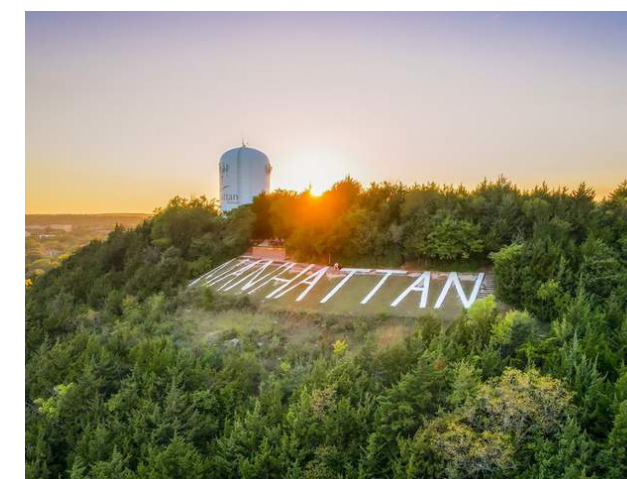
Manhattan has two iconic scenic overlooks that are beautiful viewpoints that looking out to the Konza Prairie and the City of Manhattan. This first stop is the Scenic Lookout right off of K-177 and includes a pavilion area that allows users to have a clear view of the Flint Hills. This provides a great stop along the highway to promote the human-nature connection. The other lookout is a portion of Goodnow Park off of Ehlers Road on Bluemont Scenic Drive. The lookout provides a panoramic view of Downtown Manhattan and includes large concrete letters that spell Manhattan below the structural lookout point.



**Figure 2.29** Vegetation of Konza Prairie (Skabelund 2005)



**Figure 2.30** Highway Scenic Overlook (Pinterest n.d.)



**Figure 2.31** Bluemont Scenic Overlook (KAW Aerial 2020)

### ***Pillsbury Crossing Wildlife Area***

Pillsbury Crossing is a beautiful spot near Manhattan that provides opportunities for exploration and activity. It is a low water river crossing that includes small deep-creek waterfalls, and has nice rocks for sitting that people can enjoy during the warmer months. People typically enjoy this spot in the summer due to the opportunities for canoeing, fishing and hiking. The Pillsbury Crossing wildlife area was given to the Department of Wildlife and Parks and contains 59 acres of Deep Creek channels. It is accessible to the public and includes scenic views of the northern Flint Hills region. There are short hiking trails and good channels for fishing and overall is a popular spot for relaxation and fun.

### ***Tallgrass Prairie Preserve***

The Tallgrass Prairie National Preserve is a large nature preserve that includes 39,000 acres of protected tallgrass prairie. The prairie contains more than 500 species of plants such as the prominent grasses of big bluestem, indian grass, switchgrass, and little bluestem, which dominates the majority of the preserve. The Preserve allows visitors to hike, fish, see bison, and explore the ranch that is located within the preserve. With the copious amount of vegetative species, the preserve has pollinator functions and gives wildlife several native habitats. It has a unique and rich history that dates back to the late 1800s. This preserve protects the tallgrass prairie ecosystems and educates visitors. Overall, this preserve gives users beautiful scenic views, open land to explore, and a strong connection to nature.

### ***Great Plains Nature Center***

The Great Plains Nature Center is an indoor-outdoor facility in Wichita. This nature center was designed to educate people on the flora and fauna of the Great Plains. They have programming with free exhibits and walking trails and overall provides several opportunities for outdoor exploration. Nature center programs include bird watching, and indoor wildlife observatories, which help promote the human-nature connection.



**Figure 2.32** Pillsbury Crossing Wildlife Area (“Kansas Travel” 2008)



**Figure 2.33** Tallgrass Prairie Preserve (NPS 2021)



**Figure 2.34** Great Plains Nature Center (2023)



## SITE HISTORY & CONTEXT: WASHINGTON MARLATT MEMORIAL PARK

### OVERVIEW

Washington Marlatt Memorial Park is a local public park that speaks to the characteristics of the Flint Hills and is considered to be a miniature Konza Prairie. There are multiple trails through fields of tallgrass and has incredible views from the highpoint in the park which is called “Top of the World.” The parks serves as a great place for able-bodied people to explore, hike, and enjoy leisurely time outdoors within the tallgrass prairie.

### CONTEXT

Washington Marlatt Memorial Park is located off of Seth Child Road, in the northwest part of Manhattan, within Riley County. The confines of the site are just outside the Manhattan city boundary and is managed by the City of Manhattan Parks and Recreation Department. There is around 164 acres of land, that is associated with Kansas State University. The site and its history includes large interpretive signs, areas for walking, hiking, observation, and areas to study. The land natural and is not programmed with the only current opportunities being trails and at the viewpoint. Signs note the importance of preserving the prairie and treating the park with respect.

### ECOLOGICAL INVENTORY OF SITE

The park has a strong presence of the Flint Hills character and the burn management practices for the tallgrass prairie. The site has as an interesting topography including steep hills, rolling hills, rocky soil, and native vegetation. The steep and low-rise slopes allow for a variety of kinds of hiking and exploration experiences. With the beauty of the tallgrass prairie the site brings out the character of the Flint Hills with vibrant colors and amazing views. Some trails are flat enough to be very easy to walk but the trails surfaces are prohibitive to many with physical limitations.



**Figure 2.35** Washington Marlatt Memorial Park (Skabelund 2006)



**Figure 2.36** Washington Marlatt Memorial Park Trail (Skabelund 2006)

HISTORY

Washington Marlatt Memorial Park has a unique history from its previous land owners and the transition to being a part of Kansas State University.

Washington Marlatt Memorial Park Timeline



Figure 2.37 Konza Winter View (Skabelund 2005)



PRECEDENTS

A series of precedent studies were selected and analyzed through an evaluation framework to help identify their relevance to WMMP as a nature center based on five categories: 1) use of ecotourism, environmental education, and nature-center focused ambitions, 2) similar size and dynamic of the selected site, 3) applicable programming for the selected site of WMMP, 4) goals or opportunities for tallgrass prairie restoration, and 5) enhancement of regional characteristics and aesthetics. Each precedent study was selected based on these factors, along with the availability of data and information to help guarantee a successful analysis.

Precedent List:

- 1) Wisdom Woods Master Plan (Spooner, Wisconsin)
- 2) Shangri La Nature Center (Orange, Texas)
- 3) Highlands Retreat (Pitkin County, Colorado)
- 4) Wisdom Woods Master Plan (Gray Summit, Missouri)
- 5) Shaw Nature Reserve (Teton County, Wyoming)
- 6) Westwood Hills (St. Louis Park, Minnesota)

These six precedent studies are discussed in some detail on pages 74-115.



Figure 2.38 Precedent Locations Map (Vialle, 2023)  
Adapted from (Snazzy Maps 2023)





Figure 3.0 Konza Low Light View (Hammel 2020)

# Methodology

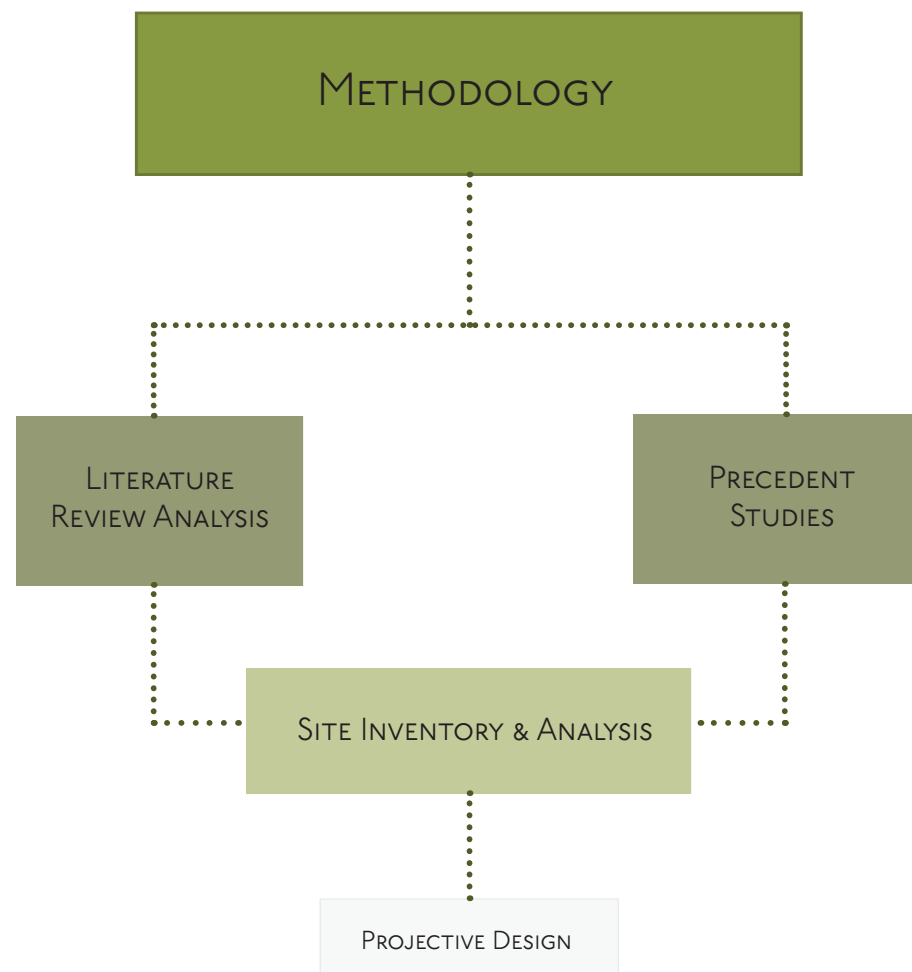
## contents

- overview
- literature review analysis
- precedent studies
- precedent study analysis
- comparative matrix
- comparative matrix charts
- precedent study conclusion
- design guidelines
- site inventory & analysis
- site exploration
- vulnerability study
- suitability study
- sketching
- gis mapping



# 3 METHODOLOGY

The methodology for this project included: 1) preparing a literature review, 2) finding and examining precedent studies, 3) site inventory and analysis of WMMP, and 4) completing a projective design program development and nature center design explorations. This approach helps synthesize literature about environmental education and ecotourism while providing a synopsis of all knowledge gathered and synthesized about WMMP in preparation for a projective design for the site. This methodology addresses the concepts and design strategies for successful and effective environmental education opportunities while exploring the research question focused on the selected site: WMMP.



**Figure 3.1** Methodology Diagram (Vialle 2023)

## LITERATURE REVIEW ANALYSIS

Findings from the literature review is shown were discussed in Chapter 2. The focus of the literature review is to provide context on the topics of environmental education and ecotourism, and selected place-based ecological learning opportunities within the Flint Hills Ecoregion. The literature review discusses the purpose and value of ecotourism, gives the regional context of the selected site, and bridges the research and the projective design by noting selected environmental education opportunities in the region. To help identify projective design considerations from the literature review, an analysis of precedents was prepared. This analysis discusses important ideas within the literature review and compares it to successful programming and design ideas derived from the precedents and how these relate to the existing conditions and future opportunities at WMMP.

The design considerations derived from this literature review analysis guide the projective design. Programming and design factors include areas for ecosystem restoration and enhancing regional plant communities, areas for rest and outdoor exploration, and additional structures, trails, and programming to increase visitor use. The two different options for nature center structures near the expanded north parking area (discussed in Chapter 4) were developed as a result of this process.

## PRECEDENT STUDIES

As part of my research, precedent studies were completed to look at the relationships between successful designs and new ecotourism opportunities at Washington Marlatt Memorial Park (WMMP). By evaluating and highlighting key aspects, meaningful design ideas and effective programming helped influence the design proposal for WMMP. This series of precedent studies were selected and analyzed using the following criteria: use of ecotourism, nature-center and environmental education focused ambitions, similar size and dynamic with the selected site, applicable programming for the selected site, opportunities for tallgrass prairie restoration, and enhancement of regional characteristics and aesthetics. Each precedent study was identified based on these factors, along with the availability of data and information to help guarantee a successful analysis.

This precedent study analysis used a framework to provide a relevant and consistent analysis. Through research strategies similar to those used within the literature review, this framework was developed as an analytical tool to make my evaluation more efficient and effective. The framework used the following criteria to find data and assess information from the precedent studies.

### **Criteria For Selecting Precedents:**

- 1. Exhibits ecotourist, nature-centered, and educational ambitions*
- 2. Relevant or similar size to Washington Marlatt Memorial Park*
- 3. Strong relationship with projected opportunities for Washington Marlatt Memorial Park*
- 4. Goals and design opportunities for tallgrass prairie restoration*
- 5. Enhancement of regional characteristics and aesthetics; connections to the Flint Hills Ecoregion*

Each of these precedents, provide a role within the overall design proposal. These precedents provide inspiration and design considerations like architectural elements, approaches for trail design, nature center programming, and educational opportunities. Along with the precedent study analysis, each study showcases images from the locations/design, in addition to a site plan showing the locations of existing programming. The final portion of each precedent study includes the project's programming and land-use in a spatial analysis. This spatial analysis identifies the relative amount (by percentage) of three elements of programming and land-use: 1) guest lodging, 2) programmed and/or designed, and 3) open space/naturalized.

It is important to note the value of each precedent study and the information collected for these six project sites. Each precedent study has a varying amount of information collected, and was analyzed for comparison and inspiration. The results from this precedent study analysis is summarized in a series of comparative matrices that evaluate precedent information and the three primary design characteristics.



Details of Precedent Research:

This was the list of details researched for each precedent study:

- 1. Location:**  
*Can be located anywhere across the US to provide a variety of types of design ideas and programming*
- 2. Primary Building Size:**  
*Identification of any buildings present, but could differ for variety and applicability*
- 3. Designer / Company:**  
*Looking at the disciplines of the designer or company for project history and experience*
- 4. Programming:**  
*Looking at the programs available to visitors and guests*
- 5. Price / Funding:**  
*Looking at potential funding locations and price ranges*
- 6. Tourism Types (presently established or future implementations):**  
*Identifying present or future tourism types and programming*
- 7. Environmental education and ecotourism connections:**  
*Looking at existing environmental education programming*
- 8. History / function / regional context:**  
*Research the historical connections to help relate the regional context to the programming and design strategies*
- 9. Relevance and application to established goals:**  
*Identifying applicable factors and relevant goals for the selected site*

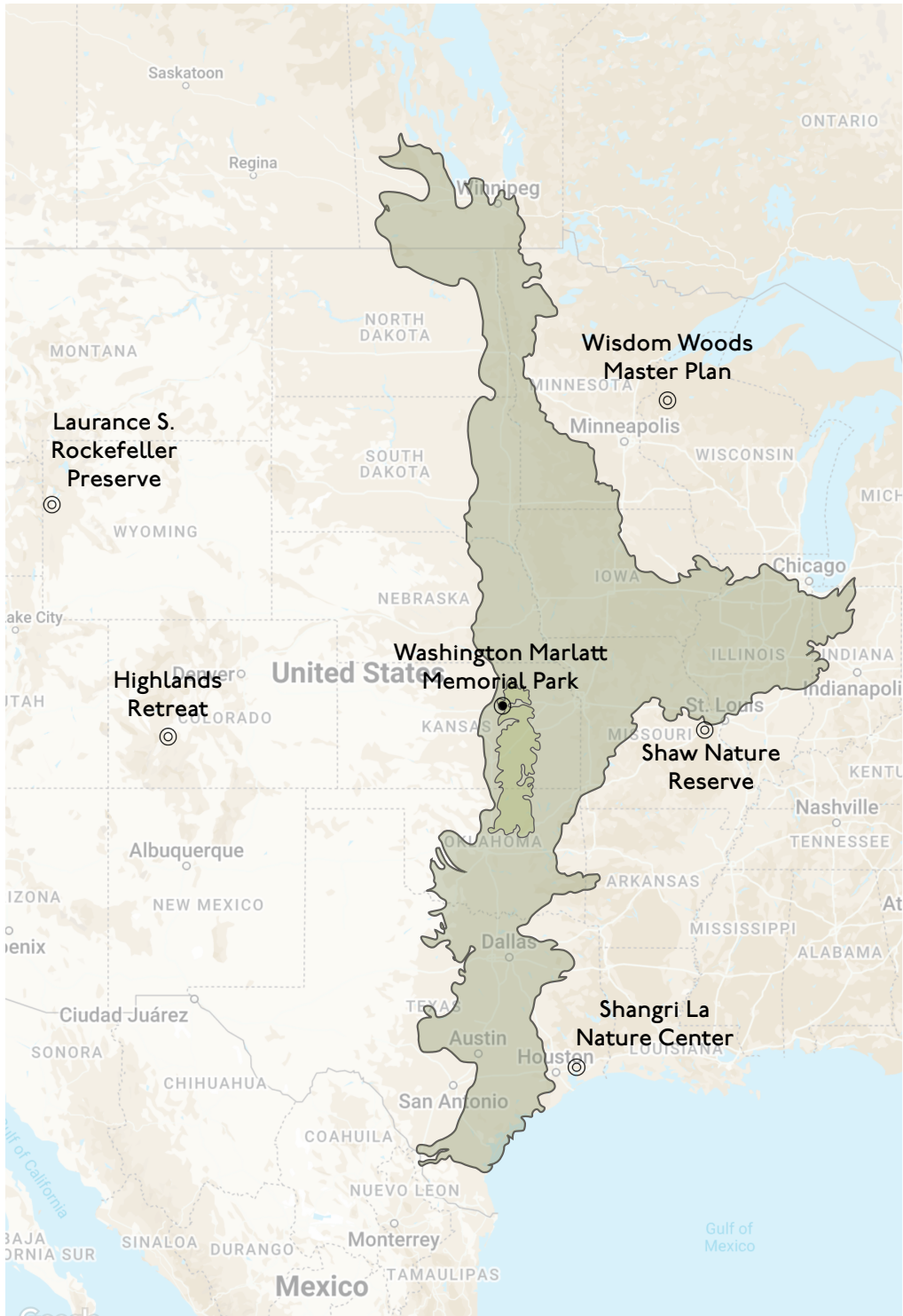


Figure 3.2 Precedent Locations Map (Vialle, 2023)  
Adapted from (Snazzy Maps 2023)



Figure 3.3 Wisdom Woods (TEN x TEN, n.d.)

# PRECEDENT

## Wisdom Woods Master Plan

Location: Spooner, Wisconsin

Size: 80 acres

Designed by: TEN x TEN, Wigen Consulting

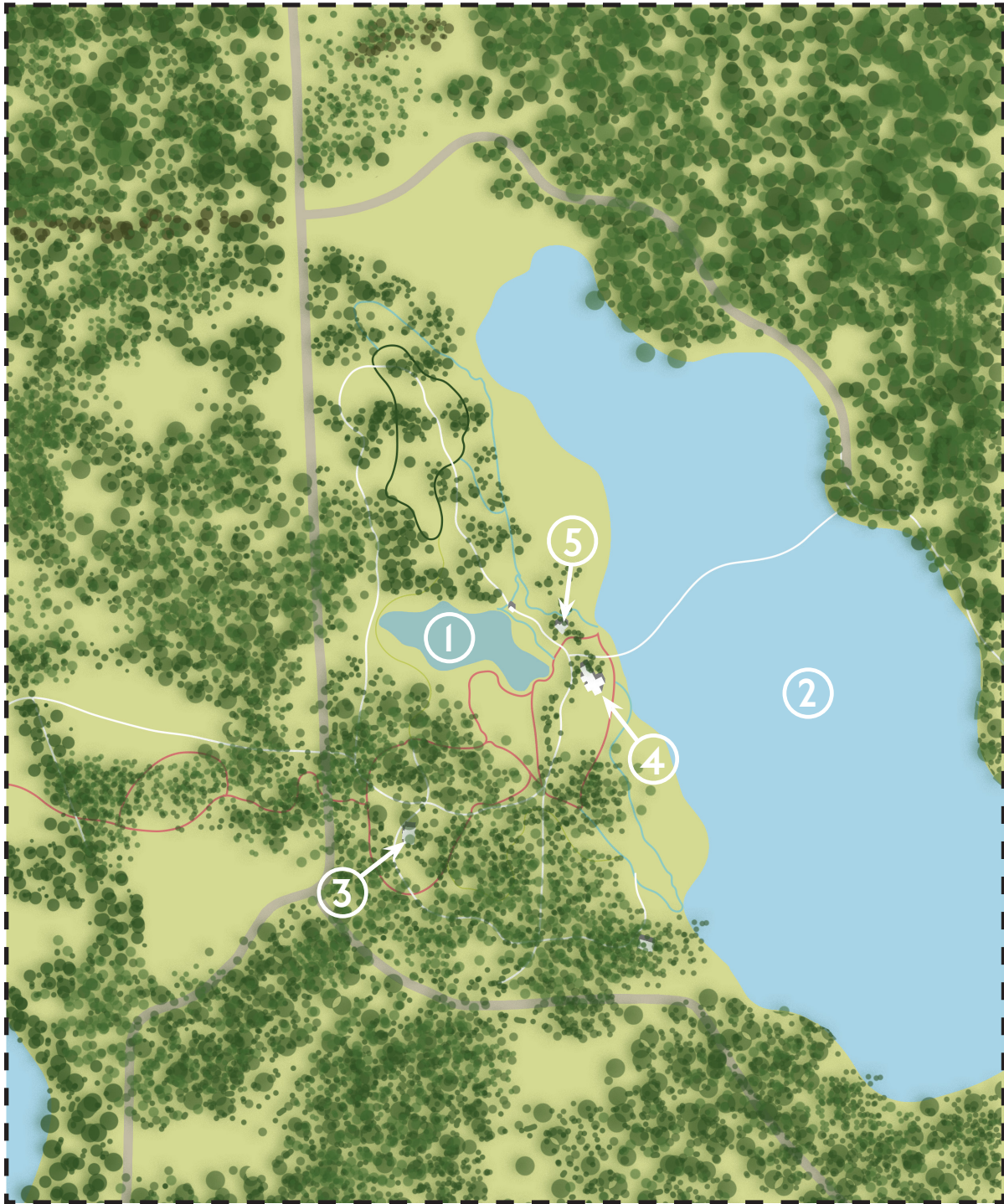
The Wisdom Woods Master Plan is a connective, community-engaging outdoor experience that provides tourists with a retreat for relaxation, housing accommodations and restorative nature landscapes. This precedent is very beneficial through its incorporation of trail systems, nature-focused design, and housing and overnight accommodations. It would serve well for implementing programming for the selected site.



Figure 3.4 Precedent Wisdom Woods Location Map (Vialle 2023)  
Adapted from (Snazzy Maps 2023)



Wisdom Woods Programming



- ① Marsh
- ③ Shop
- ⑤ The Spa

- ② Leisure Lake
- ④ Lakeside House

- Existing Trails
- Waters Edge Trail
- Red Pine Trail
- Oak Canopy Trail
- Connectors Trail

Figure 3.5 Wisdom Woods Plan (Vialle 2023)

ENVIRONMENTAL EDUCATION AND ECOTOURISM RELATIONSHIPS

The Wisdom Woods Master Plan is a successful example for diverse and dynamic ecotourism programming. The main opportunities the site includes are a shop, a spa, and a lakeside house. The site offers a wide range of nature-focused exploratory opportunities and a series of nature trails that have themes based on the areas of the site they explore. The first trail is the Red Pine Trail which includes a healing and production garden, interactive spaces within the forest, solar panels, an area for yoga, amphitheater, a fire ring and bee hives. The second trail is the Waters Edge Trail that has water-focused opportunities including a marsh platform, elevated plank walk, rest areas, and hidden trails. The next trail is the Oak Canopy Trail that includes an Oak Retreat Building, an area for nighttime exploration, and a hammocking ridge. Throughout the park and along the trails there is more programming to further connect with the wildlife and woodland areas. The design engages users to engage with wildlife through beaver viewing, bird watching/listening, boating and more.

APPLICATION

The programming of Wisdom Woods allows for maximum nature based experiences and hands on engagement. These immersive experiences reaches various age groups, making this design's programming diverse, flexible, and functional. These programs will help drive program development for WMMP.

2% GUEST LODGING  
26% PROGRAMMED  
(DESIGNED)  
72% OPEN SPACE  
(NATURALIZED)



Figure 3.6 Wisdom Woods Spatial Analysis (Vialle 2023)



# Wisdom Woods Master Plan

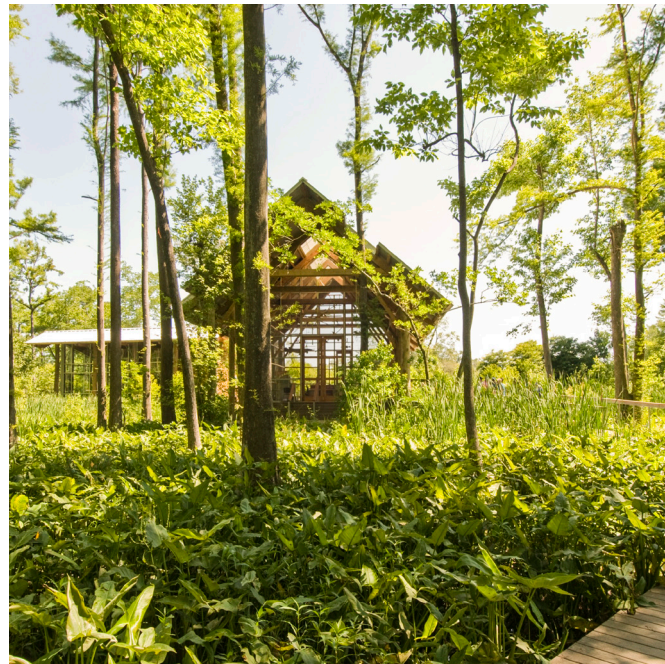
|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programming                                        | <div><div><div>- Botanical Gardens</div><div>- Trails</div><div>- Amphitheater</div><div>- Wildlife programming</div><div>- Retention / wetland planting</div></div><div><div>- Forest Variety / Protection</div><div>- Lakes (2)</div><div>- Nature Center</div><div>- Sustainable solar panels</div><div>- Meeting Locations (6+)</div></div></div>                                                                                                                                                                                                              |
| Primary Building Size                              | <div><div>- range of buildings proposed; small tea house may be similar to Marlatt Nature Center buildings)</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Tourism Types                                      | <div><div><div>- Tourism</div><div>- Ecotourism</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Environmental Education and Ecotourism Connections | <div><div><div><div>- Conservation &amp; Preservation</div><div>- Exploration / Adventure</div><div>- Trails / Walks</div><div>- Education / Signage</div><div>- Botanical Gardens</div><div>- Existing Species protection</div><div>- Wildlife Viewing</div></div><div><div>- Environmental Protection</div><div>- Species Establishment</div></div></div></div>                                                                                                                                                                                                  |
| History, Function, Regional Context                | <div><div><div>- Scenic viewing</div><div>- Environmental appreciation</div><div>- Education / Signage</div><div>- Retreat</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Application                                        | <div><div><div>- History of the surrounding environment for design</div><div>- Low impact design</div><div>- Nature engagement connections</div><div>- Wetland, botanical and retention planting design</div><div>- Botanical and nature-based exploration application</div><div>- Ecological / Educational programming inspiration</div><div>- Job opportunities</div><div>- Conservational and preservational values</div><div>- Botanical connections for enhancing WMMP's planting and species enrichment</div><div>- Placemaking strategies</div></div></div> |

Table 3.1 Wisdom Woods Table (Vialle 2023) (Appendix F)



Figure 3.7 Precedent Images (TEN x TEN, 2023)





**Figure 3.8** Shangri La (Hester 2008)

## PRECEDENT

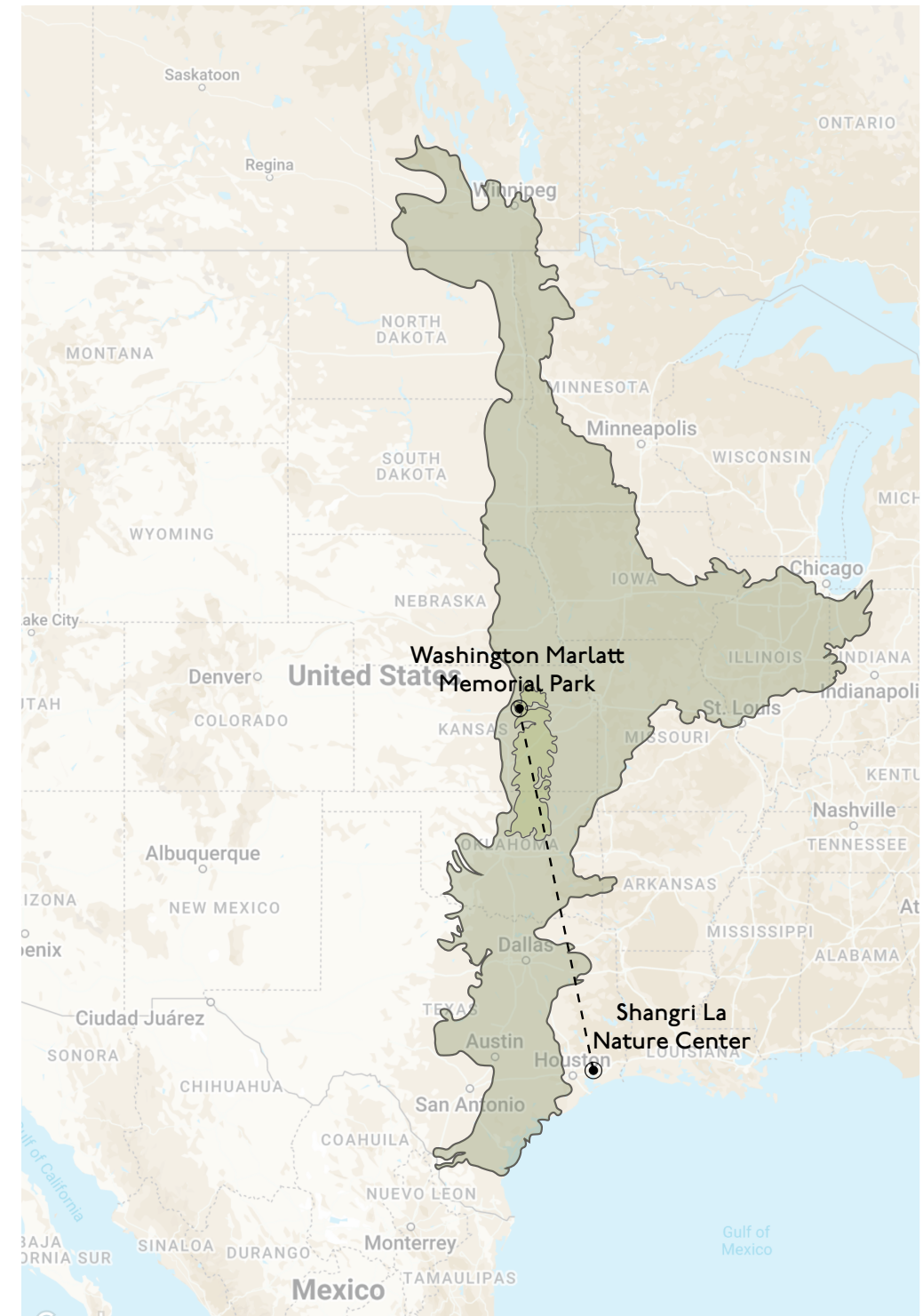
### Shangri La Nature Center

**Location:** Orange, Texas

**Size:** 250+ acres

**Designed by:** Lake | Flato Architects

The Shangri La Nature Center is a beautiful, nature-based experience along the water of the Adams Bayou. It bridges botanical gardens with education to give tourists and unique and imaginative experience. It has flowers, birds, and garden paths. It serves great as precedent for a circulation system and how to design around planted and wildlife filled areas.



**Figure 3.9** Precedent Shangri La Nature Center Location Map (Vialle, 2023)  
Adapted from (Snazzy Maps 2023)



Shangri La Nature Programming



- ① Shangri La Nature Center
- ② Visitor's Center & Courtyard
- ③ Great Lawn
- ④ Pond of the Blue Moon
- ⑤ Parking Lot
- ⑥ Entrance & Exit

Figure 3.10 Shangri Plan (Vialle, 2023)

ENVIRONMENTAL EDUCATION AND ECOTOURISM RELATIONSHIPS

The Shangri La Nature Center is a very intricate programmed design for exploration and nature-based programming. Like, the other selected precedent studies, it provides trails for viewing and engagement experiences. The site provides good context for using the existing site, and the ecosystems established. The surrounding context involves the Ruby Lake and the Adams Bayou River which helped establish the location of the nature center. This location allows for good viewing and indoor/outdoor connections. The nature center provides spaces for learning and engagement along with preservation and conversational efforts. Not only does the structure of the nature center provide for the human-nature connection but allows is a low-impact design through use sustainable materials and design that responds to the setting (for example, by using piers and boardwalks in or near wetlands).

APPLICATION

The existing programing from the Shangri La Nature Center serves as precedent for WMMP through the use of a low-impact nature center that focuses on sustainable design. The site design utilizes the surrounding landscape to help enhance the existing user experience and promote awareness of ecosystems. This design will be used as the base for WMMP through the use of the nature center structure. Furthermore, it will guide new programming for WMMP and how to effectively implement educational programming to better allow for tallgrass prairie education.

26% NEARBY  
RESIDENTIAL  
22% PROGRAMMED  
(DESIGNED)  
52% OPEN SPACE  
(NATURALIZED)



Figure 3.11 Shangri La Spatial Analysis (Vialle 2023)



Shangri La Nature Center

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programming                                        | <div><div><div>- Botanical Gardens</div><div>- Market / Shop</div><div>- Bird watching (wildlife connections)</div><div>- Tours</div></div><div><div>- Nature Center</div></div></div>                                                                                                                                                                                                                                                                    |
| Primary Bulding Size                               | <div><div>- not provided</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Tourism Types                                      | <div><div><div>- Tourism</div><div>- Ecotourism</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental Education and Ecotourism Connections | <div><div><div>- Conservation &amp; Preservation</div><div>- Exploration / Adventure</div><div>- Trails</div><div>- Education</div><div>- Botanical Gardens</div><div>- Wildlife</div><div>- Waterfront connections</div></div></div>                                                                                                                                                                                                                     |
| History, Function, Regional Context                | <div><div><div>- Bird / Wildlife watching</div><div>- Tours</div><div>- Education</div><div>- Interpretive space within an established and preserved environment</div></div></div>                                                                                                                                                                                                                                                                        |
| Application                                        | <div><div><div>- History of the surrounding environment for design moves</div><div>- Nature engagement connections</div><div>- Materials and structural inspiration</div><div>- Botanical and nature-based exploration application</div><div>- Educational programming inspiration</div><div>- Job opportunities</div><div>- Conservational and preservational values</div><div>- Wildlife connections for enhancing WMMP's programming</div></div></div> |

Table 3.2 Shangri La Table (Vialle, 2023) (Appendix F)

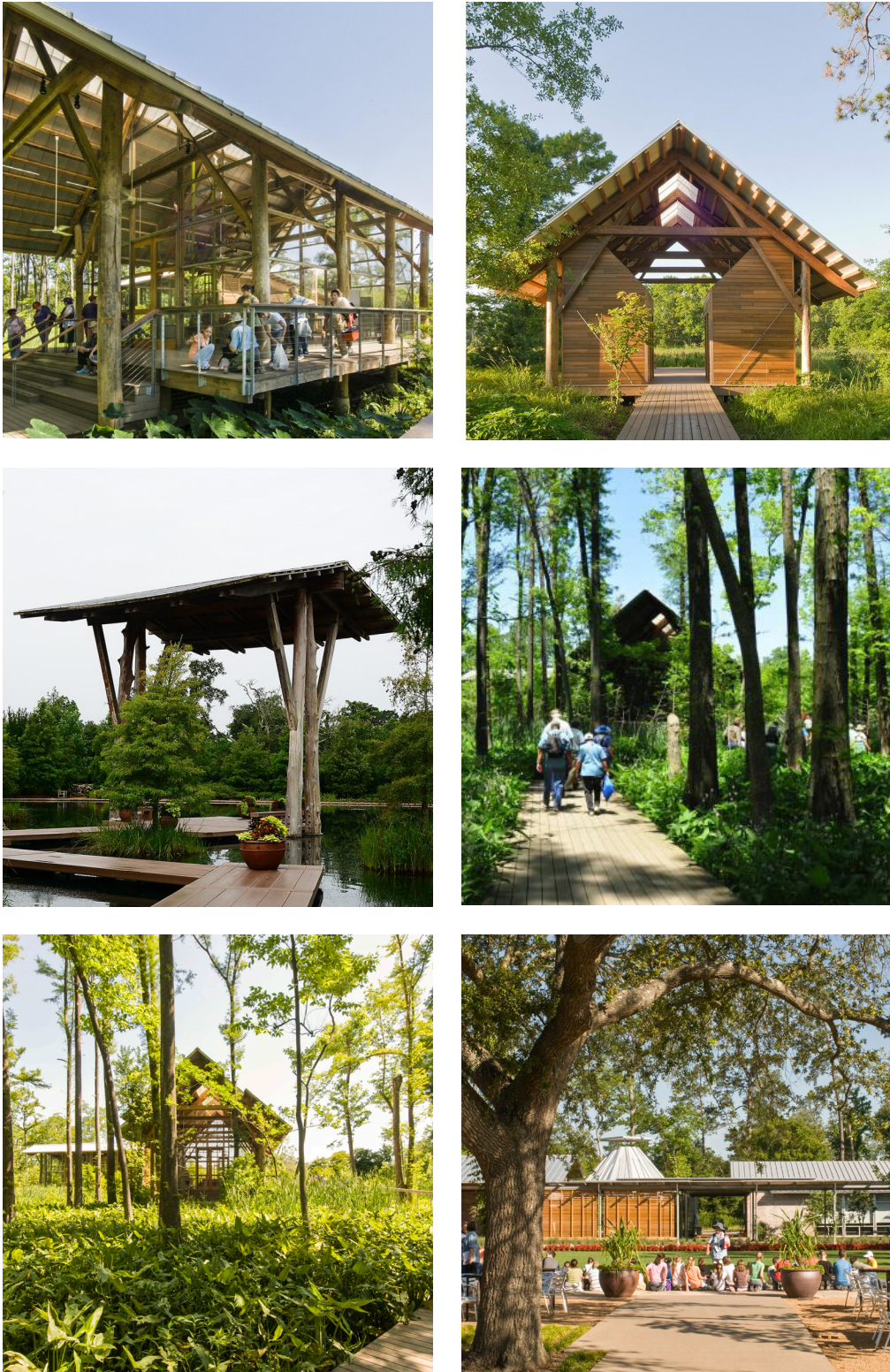


Figure 3.12 Precedent Images (Lake Flato, n.d.)





**Figure 3.13** Highlands Retreat (Design Workshop n.d.)

# PRECEDENT

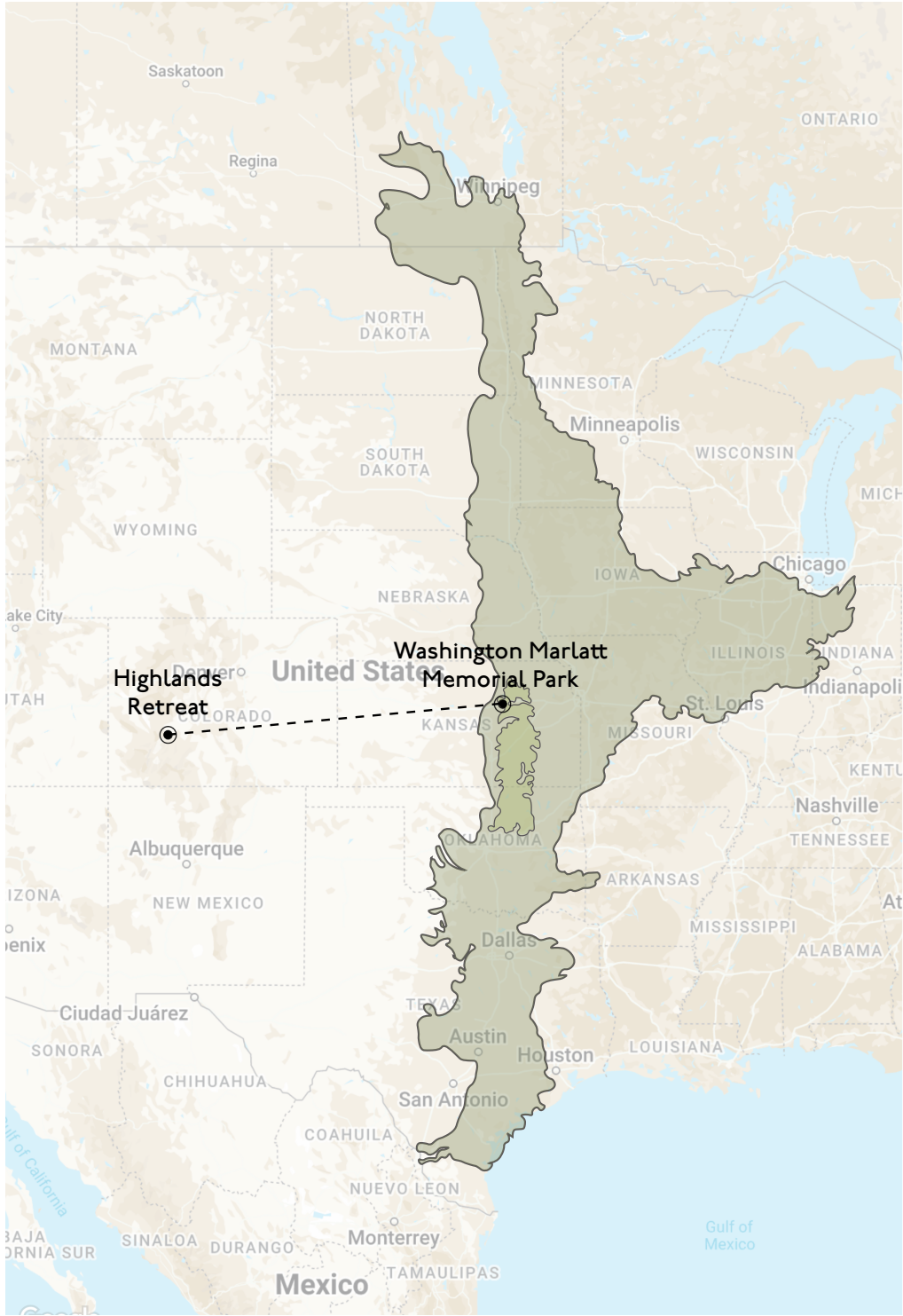
## Highlands Retreat

**Location:** Pitkin County, Colorado

**Size:** 10 acres

**Designed by:** Design Workshop inc.

The Highlands retreat is a family refuge located in the Rocky Mountains of Colorado. It has themes of connectivity and complex ecosystems that center around giving guests a sense of adventure and exploration. It is in the heart of an aspen forest which shows the regional context and how they manage their surrounding environment and designed according to the needs of the ecosystem. Gardens, trails and relaxation spaces are offered but also help cultivate their guests' outdoor experiences. There are also themes of history and cultural heritage as well.



**Figure 3.14** Highlands Retreat Location Map (Vialle, 2023)  
Adapted from (Snazzy Maps 2023)



Highlands Retreat Programming

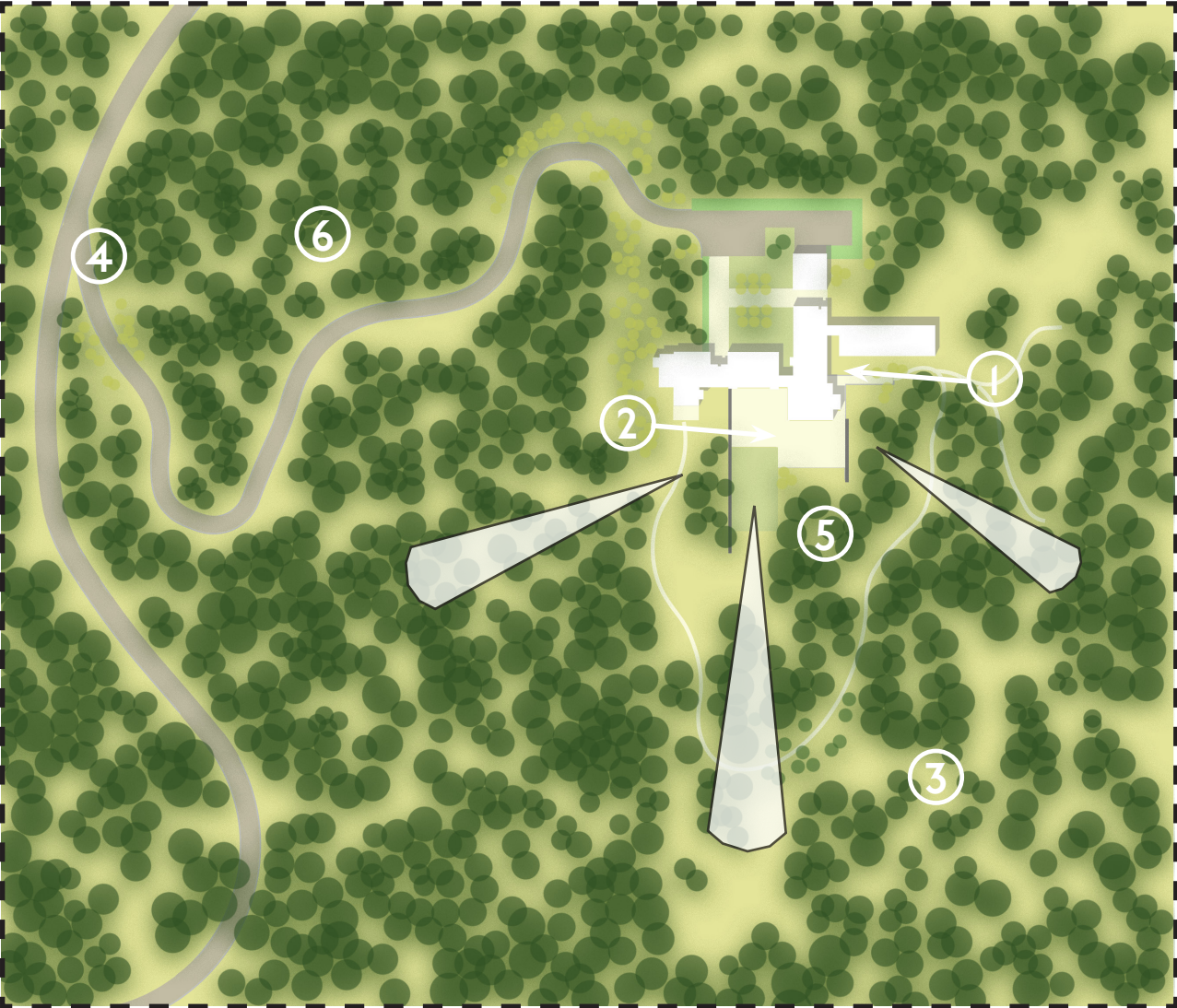


Figure 3.15 Highlands Plan (Vialle, 2023)

- ① Lodging Accommodations / Overnight Housing
- ② Central Courtyard
- ③ Existing Landscape / Vegetation
- ④ Entrance & Exit
- ⑤ Indoor / Outdoor Spatial Connections
- △ Important Views

ENVIRONMENTAL EDUCATION AND ECOTOURISM RELATIONSHIPS

The Highlands retreat addresses ecotourism values through the successful use of the surrounding landscape and region through trails and viewpoints. The site has similar goals as the other selected precedents in relation to nature-based engagement and user experience, but what is highlighted the most with this design is the ability to capture the beauty of the surrounding area. This design strongly connects to the identity of the area and is considered a very minimal design that provides for trail connections to excellent views.

APPLICATION

The Highlands Retreat values the connections to the area's specific needs and approached design in a way that would successfully use the site for viewing and leisurely experience. The success of this design incorporates rest areas, a strong courtyard space, and a remote space for people have a flexible outdoor experience. This design will be used as precedent for how to better connect the use of viewpoints within the site. Washington Marlatt Memorial Park is located in a prime place for utilizes high and low points to create unique viewing moments to see the prairie vegetation and surrounding site context.

8% GUEST LODGING  
17.5% PROGRAMMED  
(DESIGNED)  
74.5% OPEN SPACE  
(NATURALIZED)

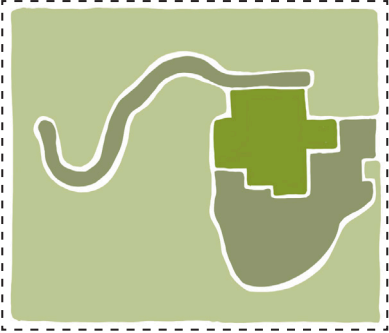


Figure 3.14 Highlands Spatial Analysis (Vialle 2023)



Highlands Retreat

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programming                                        | <div><div><div>- Wildflower Garden</div><div>- Fountains</div><div>- Courtyard (open)</div><div>- Trails</div></div><div><div>- Lodging and Dining</div></div></div>                                                                                                                                                                                                                                                                                                                                                        |
| Primary Bulding Size                               | <div><div>- not provided</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Tourism Types                                      | <div><div><div>- Tourism</div><div>- Ecotourism</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Environmental Education and Ecotourism Connections | <div><div><div>- Surrounding Aspen Forest and meadow</div><div>- Nature Trails</div><div>- Botanical Gardens (wildflower)</div><div>- Seasonal Planting</div></div></div>                                                                                                                                                                                                                                                                                                                                                   |
| History, Function, Regional Context                | <div><div><div>- History of the surrounding environment</div><div>- Adjacent Forests</div><div>- Complex ecosystem (organic soils)</div><div>- Protection of Aspen Tree species</div></div></div>                                                                                                                                                                                                                                                                                                                           |
| Application                                        | <div><div><div>- History of the surrounding environment for design moves</div><div>- Trail organization and environmental approach</div><div>- Wildflower / botanical garden design ideas</div><div>- Historical site / environmentally protected site</div><div>- Protection of local plant species by careful placement of the building mass and roadway</div><div>- Cultural heritage and environmental significance</div><div>- Materials and design element inspiration (sustainable materials used)</div></div></div> |

Table 3.3 Highlands Retreat Table (Vialle, 2023) (Appendix F)

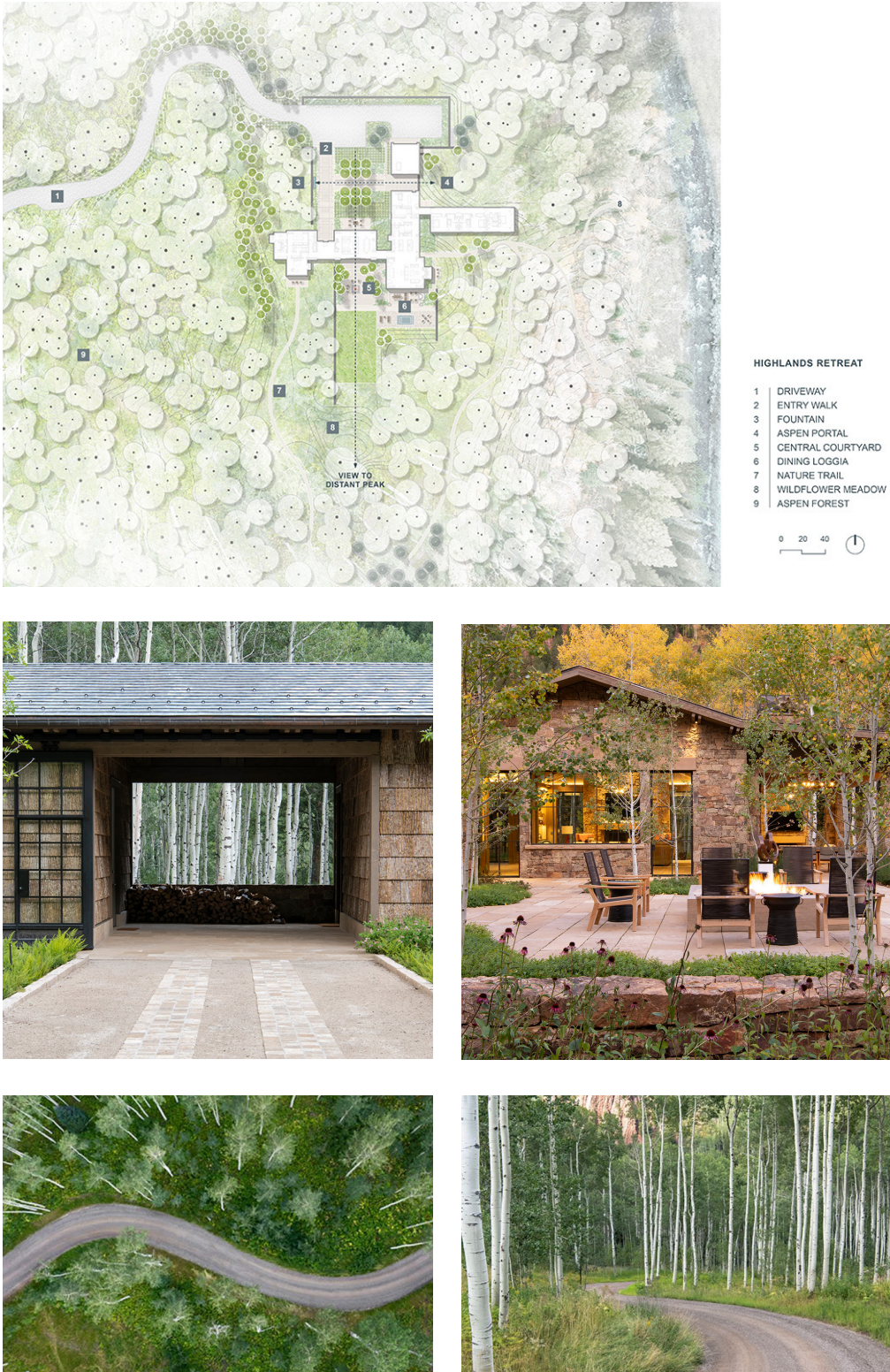


Figure 3.17 Precedent Images (Design Workshop Inc. 2021)





Figure 3.18 Shaw Nature (Skabelund 2022)

## PRECEDENT

### Shaw Nature Reserve | Missouri Botanical Garden

Location: Gray Summit, MO

Size: 2,400 acres

Designed by: Missouri Botanical Garden

The Shaw Nature Reserve is a division of the Missouri Botanical Gardens. It is a natural landscape of the Ozark Border which includes the 3.5 miles Meramec River, hiking trails, lodging opportunities and a large diversity of native plants and wildlife habitats. It is located 35 miles from St. Louis and has a mission to maintain the landscape with responsible stewardship, outreach with education and provide protection and restoration of the habitats. Shaw Nature has goals of providing public enjoyment in addition to promoting and encouraging sustainable and eco-friendly landscapes and gardens.



Figure 3.19 Precedent Shaw Nature Reserve Location Map (Vialle, 2023)  
Adapted from (Snazzy Maps 2023)



Shaw Nature Reserve Programming



Figure 3.20 Shaw Nature Map (Vialle, 2023)

- |                                         |                            |
|-----------------------------------------|----------------------------|
| ① Main Entrance & Visitor's Center      | ② Visitor's Center         |
| ③ Overnight Center (Lodging)            | ④ Meramec River            |
| ⑤ Nature Exploration/Demonstration Area | ⑥ Parking                  |
| ⑦ Prairie                               | ⑧ Wetland Area & Boardwalk |

ENVIRONMENTAL EDUCATION AND ECOTOURISM RELATIONSHIPS

The Shaw Nature Reserve is located along the Meramec River. This region is unique and contains many different ecosystems so with this diverse natural habitat, it gives the site many opportunities for programming and activities. The site has outdoor classrooms that allow for interpretive and immersive learning, and with the trail system, the site serves as an interpretive explorative habitat. The wetland areas allow people to observe wildlife, plant life, and wildflowers. The main trail system offers a variety of options for those who don't want to participate in all levels of exploration. There are options for leisurely strolls, the prairie areas have trails that gives users a chance to see many species of native grasses and forbs while also giving the site a native aesthetic. The reserve also provides overnight lodging for events like wedding, overnight cabins for children's events, and other educational programs.

APPLICATION

The programming of Shaw Nature Reserve allows for maximum nature based experiences and hands on engagement. These immersive experiences reach various age groups, making this design's programming diverse, flexible, and functional. Environmental education programs can help inform program development for WMMP.

2% GUEST LODGING  
10.6% PROGRAMMED  
(DESIGNED)  
87.4% OPEN SPACE  
(NATURALIZED)

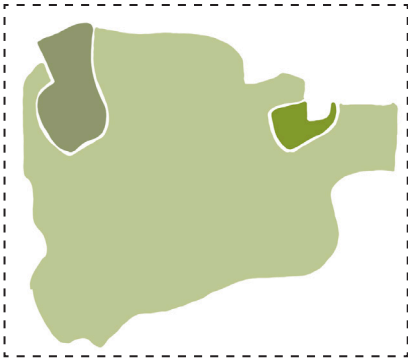


Figure 3.21 Shaw Nature Spatial Analysis (Vialle 2023)



Shaw Nature Reserve | Missouri Botanical Garden

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programming                                        | <div><div><div>- Wildflower Garden</div><div>- Overnight lodging</div><div>- Learning / Mixed-use Center</div><div>- Trails</div><div>- Outdoor classrooms</div></div><div><div>- Lodging and Dining</div><div>- Different Ecosystems</div><div>- Amphitheater</div><div>- Observation / Demonstration areas</div></div></div>                                                                                                                                                                             |
| Primary Bulding Size                               | <div><div>- not provided</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Tourism Types                                      | <div><div><div>- Tourism</div><div>- Ecotourism</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Environmental Education and Ecotourism Connections | <div><div><div>- Surrounding Environment</div><div>- Nature Trails</div><div>- Botanical Gardens (wildflower)</div><div>- Seasonal Planting</div><div>- Waterfront connections</div><div>- Prairie, wetland, riparian areas, creeks, glades, pollinator and botanical gardensl</div></div></div>                                                                                                                                                                                                           |
| History, Function, Regional Context                | <div><div><div>- History of the surrounding environment</div><div>- Education</div><div>- Adjacent Forests</div><div>- Complex / and diverse trail system</div><div>- Protection of ecosystems</div></div></div>                                                                                                                                                                                                                                                                                           |
| Application                                        | <div><div><div>- History of the surrounding environment for design moves</div><div>- Education and facilities</div><div>- Trail organization and environmental approach</div><div>- Wildflower / botanical garden design ideas</div><div>- Historical site / environmentally protected site</div><div>- Protection of local plant species</div><div>- Cultural heritage and environmental significance</div><div>- Materials and design element inspiration (sustainable materials used)</div></div></div> |

Table 3.4 Shaw Nature Reserve Table (Vialle, 2023) (Appendix F)

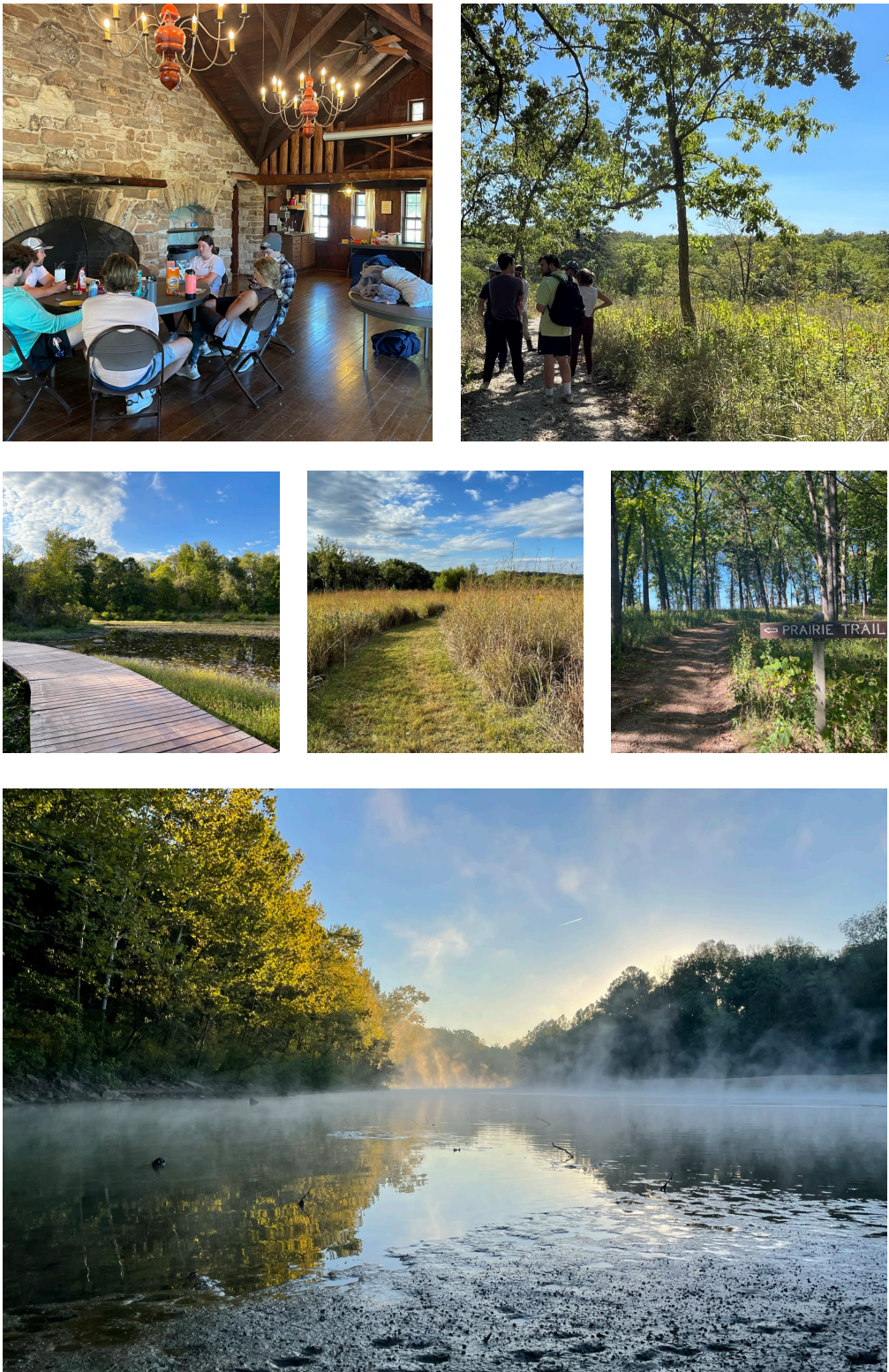


Figure 3.22 Precedent Images (Skabelund et al, 2022)





Figure 3.23 Laurance S. (Humstone n.d.)

## PRECEDENT

### Laurance S. Rockefeller Preserve

Location: Teton County, Wyoming

Size: 1,100 Acres

Designed by: CLB Architects

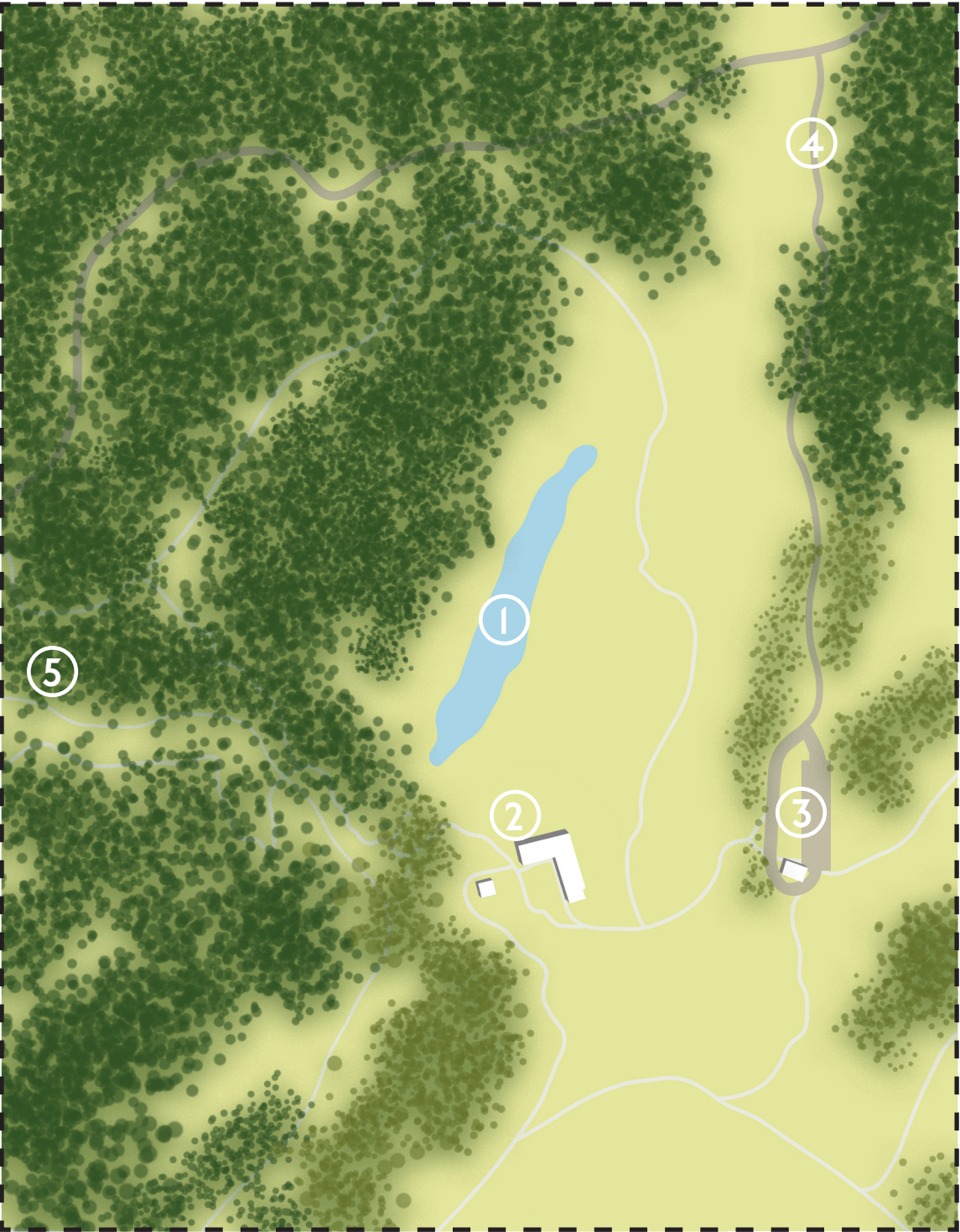
The Laurance S. Rockefeller Preserve is a large naturally preserved area with explorative trails and a visitor's center. It is a large preserve that includes various opportunities such as hiking, exploring the nearby lake and wildlife viewing. There are other programs for many age groups like rangers and exhibits. People can enjoy the outdoor scenery and also learn about the innovative environmental design of the center.



Figure 3.24 Precedent Laurance S Location Map (Vialle, 2023)  
Adapted from (Snazzy Maps 2023)



Laurance S. Rockefeller Preserve Programming



- ① Small Pond
- ② Visitor's Center
- ③ Parking
- ④ Main Entrance / Drive
- ⑤ Trail Loop near Lake Creek

Figure 3.25 Laurance S. Plan (Vialle, 2023)

ENVIRONMENTAL EDUCATION AND ECOTOURISM RELATIONSHIPS

The Laurance S. Rockefeller is located within Grand Teton National Park, and is a large preserve that used to be considered the JY Ranch. It is near the Phelps Lake and overall is a great location for people to be immersed in the surrounding nature. The site offers several amenities for its users, and overall has many opportunities to show the beauty of the surrounding landscape. The visitors center facility has a minimal yet effective design that allows users to explore and learn at the pace they desire. Due to the facility being small-scale and near an existing highway, it is a great example of a low-impact and undistruptive to the integrity of the site.

APPLICATION

With the Laurance S. Rockefeller Preserve having values of conservation stewardship, the goals of the site have great connections to the possibilities for WMMP. The site exercises conservation of native vegetation, a low-impact facility, and successful interpretive functionality. This design is beneficial due to the dynamic of how visitors can pick and chose their involvement with the site. With historical preservation being the foundation of the site, it connects well to the WMMP and the history of the Flint Hills.

0% GUEST LODGING  
9% PROGRAMMED (DESIGNED)  
91% OPEN SPACE (NATURALIZED)



Figure 3.26 Laurance S. Spatial Analysis (Vialle 2023)



Laurance S. Rockefeller Preserve

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programming                                        | <div><div><div>- Lake</div><div>- Trails</div><div>- Visitor's Center</div><div>- Ranger activities for Children</div></div><div><div>- Sensory exhibits</div></div></div>                                                                                                                                                                                                                                                          |
| Primary Bulding Size                               | 7,000-square-foot Interpretive Center                                                                                                                                                                                                                                                                                                                                                                                               |
| Tourism Types                                      | <div><div>- Tourism</div><div>- Ecotourism</div></div>                                                                                                                                                                                                                                                                                                                                                                              |
| Environmental Education and Ecotourism Connections | <div><div>- Surrounding Aspen Forest and sagebrush meadow</div><div>- Nature Trails</div><div>- Botanical Gardens (wildflower)</div><div>- Seasonal Planting</div></div>                                                                                                                                                                                                                                                            |
| History, Function, Regional Context                | <div><div>- History of the surrounding environment</div><div>- Adjacent Lake</div><div>- Protection of site integrity</div><div>- Tours (provided through Ranger Programming)</div></div>                                                                                                                                                                                                                                           |
| Application                                        | <div><div>- History of the surrounding environment for design moves</div><div>- Trail organization and environmental approach</div><div>- Historical site / environmentally protected site</div><div>- Protection of local plant species</div><div>- Cultural heritage and environmental significance</div><div>- Materials and design element inspiration (sustainable materials used)</div><div>- Low-impact Facility</div></div> |

Table 3.5 Laurance S. Table (Vialle, 2023) (Appendix F)



Figure 3.27 Precedent Images (ASLA 2014)





**Figure 3.28** Westwood Hills (HGA n.d.)

## PRECEDENT

### Westwood Hills Nature Center

**Location:** St. Louis Park, Minnesota

**Size:** 160 acres

**Designed by:** HGA

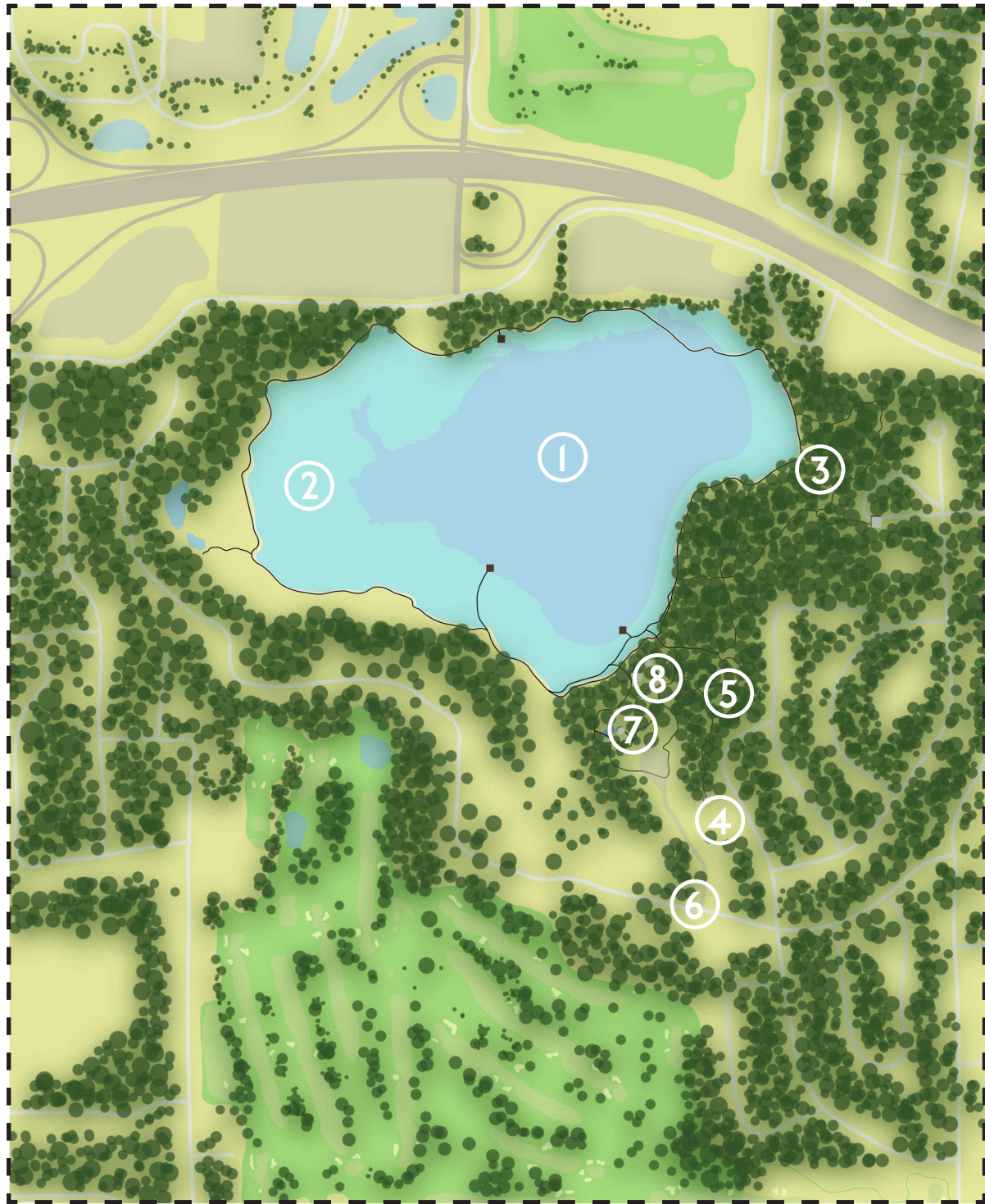
Westwood Hills Nature Center is a 160-acre park that is located within an area with prairie, forest, marsh areas, and trails that spread throughout the whole park. The natural preserve is a beautiful restorative area that provides habitats for several animals including deer, fox, minx and owls. Trails and other programming are open year-round and allow users to observe wildlife and learn about preservation within the nature center and educational programming. One of the main feature of the park is the zero-energy sustainable nature center, which allows for people to learn and connect better with nature. The ecosystems that are available to explore were originally present but were expanded to give the site its full environmental potential. This site offers education-focused programming, classrooms available for use and many multifunctional areas that can serve as event spaces and provide a place for effective community outreach.



**Figure 3.29** Precedent Westwood Hills Location Map (Vialle, 2023)  
Adapted from (Snazzy Maps 2023)



Westwood Hills Programming



- ① Westwood Lake
- ② Marsh
- ③ Maple Basswood
- ④ Prairie
- ⑤ Pine
- ⑥ Entrance
- ⑦ Playground, Parking, Restrooms
- ⑧ Interpretive Center

Figure 3.30 Westwood Plan (Vialle, 2023)

- Pine Trail (crushed concrete)
- Paved Trail (ADA)
- Trail Around Lake (includes: boardwalks, crushed concrete, paved, woodchip, and stairs)
- Connectors Trail

ENVIRONMENTAL EDUCATION AND ECOTOURISM RELATIONSHIPS

The Westwood Hills Nature Center is a very successful site with the dynamic of using the existing ecosystems and expanding on the opportunities they could provide. Visitors are able to use the site to cultivate learning, engage the community and have a place for free form exploration. With the opportunities from site and the surrounding context of the ecosystem, the site provides diverse trail system that gives opportunities for all groups of people. The trail system has opportunities for ADA access where there is fully paved circulation, along with waterfront boardwalks, crushed concrete, woodchips and level changes including stairs and bridges. The rest of the site centers around providing a variety of spaces with different experiences to enhance the human-nature connection. The site offers an aviary for bird viewing, a playground for children to play and many pavilion spaces for rest.

APPLICATION

The programming from Westwood Hills serves as the final precedent for the projective design for the selected site of WMMP. WMMP has existing ecosystems established on site with maintenance practices of the surrounding ecosystem, so this precedent will help guide the goals of enhancing the present ecosystems on site. This site also provides a great example of a low-impact and/or zero-energy facility option for a new nature center for the selected site. This nature center includes learning programs, nearby outdoor classrooms, and multi-use spaces.

46% NEARBY RESIDENTIAL

35% PROGRAMMED (DESIGNED)

19% OPEN SPACE (NATURALIZED)



Figure 3.31 Westwood Hills Spatial Analysis (Vialle, 2023)



Westwood Hills Nature Center

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programming                                        | <div><div><div>- Various ecosystems</div><div>- Trails</div><div>- Nature center</div><div>- Playground</div></div><div><div>- Pavilion Spaces</div><div>- Apiary</div><div>- Boardwalks, Decks, Docks</div><div>- Canoeing</div></div></div>                                                                                                                                                                                                                                                                                                         |
| Primary Bulding Size                               | <div><div>- not provided</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Tourism Types                                      | <div><div><div>- Tourism</div><div>- Ecotourism</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Environmental Education and Ecotourism Connections | <div><div><div>- Conservation &amp; Preservation</div><div>- Exploration / Adventure</div><div>- Trails</div><div>- Education</div><div>- Botanical Gardens</div><div>- Wildlife</div><div>- Waterfront connections</div><div>- ADA options</div></div></div>                                                                                                                                                                                                                                                                                         |
| History, Function, Regional Context                | <div><div><div>- Use of surrounding environment</div><div>- Adjacent Forests / Waterfront</div><div>- ADA Opportunities</div><div>- Education, events and mixed-use opportunities</div><div>- Interpretive space within an established and preserved environment</div><div>- Low-impact design (zero-energy / sustainable)</div></div></div>                                                                                                                                                                                                          |
| Application                                        | <div><div><div>- History of the surrounding environment for design moves</div><div>- Nature engagement connections</div><div>- Materials and structural inspiration</div><div>- Botanical and nature-based exploration application</div><div>- Educational programming inspiration</div><div>- ADA opportunities inspiration</div><div>- Job opportunities</div><div>- Conservational and preservational values</div><div>- Wildlife connections for enhancing WMMP's programming</div><div>- Ecosystem enhancement / establishment</div></div></div> |

Table 3.6 Highlands Retreat Table (Vialle, 2023) (Appendix F)



Figure 3.32 Precedent Images (HGA n.d.)

COMPARATIVE MATRIX

Following the precedent studies and their evaluations, a comparative matrix was compiled to collect all relevant information and compare details that could help guide the projective design. This information includes: Size of Site, Location/Distance From Selected Site, Level of Impact, Types of Environmental Education and Ecotourism Opportunities Used, and Spatial Analysis.

|                                                                    | <i>Wisdom Woods Master Plan</i>                                                                                                                                                                                                                                             | <i>Shangri La Nature Center</i>                                                                                                                                                                                                                        | <i>Highlands Retreat</i>                                                                                                                                   |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SIZE OF SITE                                                       | 80 acres                                                                                                                                                                                                                                                                    | 250 acres                                                                                                                                                                                                                                              | 10 acres                                                                                                                                                   |
| LOCATION / DISTANCE FROM SELECTED SITE                             | Located in Spooner, Wisconsin; approximately 686 miles (10.5 hrs)                                                                                                                                                                                                           | Located in Orange, Texas; approximately 803 miles (12.5 hrs)                                                                                                                                                                                           | Located in Pitkin County, Colorado; approximately 691 miles (10 hrs)                                                                                       |
| LEVEL OF IMPACT                                                    | Low-impact                                                                                                                                                                                                                                                                  | Medium-impact                                                                                                                                                                                                                                          | Medium-impact                                                                                                                                              |
| TYPES OF ENVIRONMENTAL EDUCATION AND ECOTOURISM OPPORTUNITIES USED | <ul style="list-style-type: none"><li>- conservation/preservation areas</li><li>- exploration/adventure</li><li>- trails</li><li>- education/signage</li><li>- botanical gardens</li><li>- wildlife viewing</li><li>- vegetative species protection/establishment</li></ul> | <ul style="list-style-type: none"><li>- conservation/preservation areas</li><li>- exploration/adventure</li><li>- trails</li><li>- education/signage</li><li>- botanical gardens</li><li>- wildlife viewing</li><li>- waterfront connections</li></ul> | <ul style="list-style-type: none"><li>- conservation/preservation areas</li><li>- trails</li><li>- botanical gardens</li><li>- seasonal planting</li></ul> |
| SPATIAL ANALYSIS                                                   | 2% guest lodging<br>26% programmed/ designed<br>72% open space/ naturalized                                                                                                                                                                                                 | 26% nearby residential<br>22% programmed/ designed<br>52% open space/ naturalized                                                                                                                                                                      | 8% guest lodging<br>17.5% programmed/ designed<br>74.5% open space/ naturalized                                                                            |

Table 3.7 Comparative Matrix Table (Vialle, 2023)

|                                                                    | <i>Shaw Nature Reserve</i>                                                                                                                                                                                                                                                                         | <i>Laurance S. Rockefeller</i>                                                                                                                                               | <i>Westwood Hills Nature Center</i>                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SIZE OF SITE                                                       | 2,400 acres                                                                                                                                                                                                                                                                                        | 1,100 acres                                                                                                                                                                  | 160 acres                                                                                                                                                                                                                                                                                                               |
| LOCATION / DISTANCE FROM SELECTED SITE                             | Located in Gray Summit, Missouri; approximately 351 miles (6.5 hrs)                                                                                                                                                                                                                                | Located in Teton County, Wyoming; approximately 983 miles (16 hrs)                                                                                                           | Located in St. Louis Park, Minnesota; approximately 566 miles (8.5 hrs)                                                                                                                                                                                                                                                 |
| LEVEL OF IMPACT                                                    | Low-Impact                                                                                                                                                                                                                                                                                         | Low-impact                                                                                                                                                                   | Low-impact                                                                                                                                                                                                                                                                                                              |
| TYPES OF ENVIRONMENTAL EDUCATION AND ECOTOURISM OPPORTUNITIES USED | <ul style="list-style-type: none"><li>- conservation/preservation areas</li><li>- exploration/adventure</li><li>- trails</li><li>- education/signage</li><li>- botanical gardens</li><li>- wildlife viewing</li><li>- vegetative species protection/establishment</li><li>- picnic areas</li></ul> | <ul style="list-style-type: none"><li>- conservation/preservation areas</li><li>- exploration/adventure/ sensory experiences</li><li>- trails</li><li>- activities</li></ul> | <ul style="list-style-type: none"><li>- conservation/preservation areas</li><li>- exploration/adventure</li><li>- trails</li><li>- botanical/pollinator gardens</li><li>- education/signage</li><li>- waterfront connections</li><li>- wildlife viewing</li><li>- vegetative species protection/establishment</li></ul> |
| SPATIAL ANALYSIS                                                   | 2% guest lodging<br>10.6% programmed/ designed<br>87.4% open space/                                                                                                                                                                                                                                | 0% guest lodging<br>9% programmed/ designed<br>91% open space/naturalized                                                                                                    | 46% nearby residential<br>35% programmed/ designed<br>19% open space/naturalized                                                                                                                                                                                                                                        |



COMPARATIVE MATRIX CHARTS

The selected precedents were further analyzed for specific characteristics and features of the designs and inspiration for the projective design. These characteristics were divided into three different matrices with three categories: 1) Preservation/Conversation Practices, 2) Productive Use of Trails and Programming, and 3) Nature Center/Educational Programming.

Summary and Reflection

The central theme from the comparative matrices is focused on finding common and useful programming and design ideas for the projective design. All of the selected precedents reach towards a design that helps to enhance the existing location through use of programming and effective design strategies. Many of the precedents include various effective trail systems, nature education centers and types of botanical and pollinator gardens. The projective design will involve and utilize ideas from each of the selected precedent studies and the comparative matrices help to identify which characteristics and/or programming will be most beneficial to incorporate in the projective design.

Additionally, the precedent studies touch on the importance of preservation and conservation values through the use of minimal or low-impact design strategies. Preservation and ecosystem management is a highly effective and very important strategy for the selected site, WMMP, due to the existing park programming of tallgrass prairie conservation.

Overall, being able to create a useful programming with trail systems, various types of gardens and nature education centers could help bring the selected site to a low-impact environmental education nature center design. Users will have new opportunities for exploration, areas to cultivate learning, and provide useful spaces to experience the rich character of the Flint Hills tallgrass prairie.

PRESERVATION AND CONSERVATION PRACTICES

|                              | Preserves existing areas of the site and the natural landscape | Connects to the surrounding site context and ecoregion | Utilizes sustainable practices and has focused conservation goals | Contains more open space and/or natural lands than design disturbance |
|------------------------------|----------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------|
| Wisdom Woods Master Plan     | ✓                                                              | ✓                                                      | ✓                                                                 | ✓                                                                     |
| Shangri La Nature Center     |                                                                | ✓                                                      | ✓                                                                 | ✓                                                                     |
| Highlands Retreat            | ✓                                                              | ✓                                                      |                                                                   | ✓                                                                     |
| Shaw Nature Reserve          | ✓                                                              | ✓                                                      | ✓                                                                 | ✓                                                                     |
| Laurance S. Rockefeller      | ✓                                                              | ✓                                                      |                                                                   | ✓                                                                     |
| Westwood Hills Nature Center | ✓                                                              | ✓                                                      | ✓                                                                 | ✓                                                                     |

PRODUCTIVE USE OF TRAILS AND PROGRAMMING

|                              | Integrative and diverse trail system | Use of signage and or trail enhancing programming | Additional ecosystems expanding on the ecoregion type | Provides ADA and/or levels of accessibility throughout site |
|------------------------------|--------------------------------------|---------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|
| Wisdom Woods Master Plan     | ✓                                    | ✓                                                 |                                                       | ✓                                                           |
| Shangri La Nature Center     |                                      | ✓                                                 | ✓                                                     | ✓                                                           |
| Highlands Retreat            |                                      |                                                   |                                                       | ✓                                                           |
| Shaw Nature Reserve          | ✓                                    | ✓                                                 | ✓                                                     |                                                             |
| Laurance S. Rockefeller      |                                      |                                                   |                                                       |                                                             |
| Westwood Hills Nature Center | ✓                                    | ✓                                                 | ✓                                                     | ✓                                                           |

NATURE CENTERS AND EDUCATIONAL PROGRAMMING

|                              | Nature centers and/or mixed-use facilities | Utilizes facilities and/or structures for events and community outreach | On-site programming and opportunities for a range of demographics |
|------------------------------|--------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------|
| Wisdom Woods Master Plan     | ✓                                          | ✓                                                                       | ✓                                                                 |
| Shangri La Nature Center     | ✓                                          | ✓                                                                       | ✓                                                                 |
| Highlands Retreat            | ✓                                          |                                                                         |                                                                   |
| Shaw Nature Reserve          | ✓                                          | ✓                                                                       | ✓                                                                 |
| Laurance S. Rockefeller      | ✓                                          | ✓                                                                       | ✓                                                                 |
| Westwood Hills Nature Center | ✓                                          | ✓                                                                       | ✓                                                                 |

Table 3.8 Comparative Goals Matrix Table (Vialle, 2023)

## PRECEDENT ANALYSIS CONCLUSION

From these precedent studies it is evident that programming and design are crucial for a successful nature-based experience. Environmental education is promoted through regional enhancement and educational opportunities like nature centers. Nature center facilities and landscapes serve as spaces to help cultivate learning and provide a purposeful space for growth, outreach and engagement. This analysis has provided successful strategies for educational programming and serves as inspiration for the design proposal for WMMP.

### KEY FACTORS:

#### *Nature Center Design*

The selected precedents that included nature centers or facilities for mixed-use spaces have a very strong impact on the success of educational programming. The purpose of these spaces is to allow for integrative experiences, unique ways to educate and promote the human-nature connection. Key takeaways from the precedent studies were about the most successful ways to orient, structure and layout a nature center based on existing site conditions. Important considerations include: orientation of structures based upon site opportunities, viewpoints, and circulation enhancement. These factors of structural characteristics are to be strongly considered throughout the projective design.

#### *Facility Dynamic*

Several of the precedents had architectural components that provide various opportunities. Some of these precedents had a primary facility and others multiple facilities with various programming. Options taken from these precedents and other inspiration led the designer to consider possible facilities with different kinds of programming. This led the projective design to seek the most effective nature-based experiences.

#### *Programming*

All of the precedents have a variety of programming and site opportunities, based on the ecoregion they are located in. Nature centers offer programming for active learning, pin-up boards, tours, hand-on opportunities, historical/cultural connections, and many others to engage users.

#### *Indoor / Outdoor Relationship*

Many of the precedents have facilities that allow users to have beneficial indoor and outdoor experiences. With the use of an indoor / outdoor facility programming, the existing site conditions can be used as a guide for placement and spatial organization of a nature center. With the projective design, considerations for a successful indoor/outdoor relationship will help connect users to both interior programming and exterior experiences. Opportunities could be: viewing platforms to enhance visual connections, open spaces and minimal enclosure for a healthy balance of structure and flexibility, and overall ease of access between facilities to increase usability of site amenities.

#### *Conservation / Preservation*

One of the primary purposes of this report is to utilize the existing conservation/preservation value of the Konza Prairie and Flint Hills Ecoregion. Through careful consideration of the projective design, facility programming and spatial organization was guided by areas of disturbance and the needs for ecosystem conservation and preservation on site. This connects back to some of the core values of environmental education being: environmental awareness, preservation of unique tourism, and sustainable revenues for tourism destinations.

#### *Ecoregional Environmental Education*

The last key factor is to effectively speak to the beauty and unique culture of the Flint Hills Ecoregion. The central theme is to enhance the tallgrass prairie will simultaneously promoting awareness and educational experiences.



# DESIGN GUIDELINES

The completed precedent studies allowed for an analysis and beneficial range of opportune programming for the projective design. For WMMP, it leads towards a ecotourism-focused site with an emphasis on environmental education opportunities. Guidelines have been determined to help effectively push two projective design scenarios that could enhance the identity and implement successful educational programming for WMMP.

- 1. Conservation of tallgrass prairie on-site.*
- 2. A successful nature center and/or series of facilities that offer users a range of educational, ecotourism and explorative experiences.*
- 3. Use of existing site conditions to lead towards a low-impact design of WMMP.*
- 4. Propose a secondary design that expands off of the low-impact design for a more enhanced design for WMMP.*
- 5. Establish site programming to promote the human-nature connection through effective indoor/outdoor relationships.*
- 6. Speak to the character of the Flint Hills Ecoregion and local identity of the WMMP site context.*

CONSERVATION

ACCESSIBILITY

EDUCATION



Figure 3.33 Washington Marlatt Memorial Park Turnaround (Skabelund 2023)



# SITE INVENTORY & ANALYSIS

An important portion of the projective design process is site inventory and site analysis. Through site visits, exploration, photography, sketching, and GIS mapping, an analysis was exercised to fully understand the site prior to schematic design. One of the main benefits of doing site inventory and analysis is to be able to see your starting point and reference the state of the site before you begin to design. From the designer's point of view, it allows us to see things clearly but also bring in a sense of creativity for possibilities and potential design moves. The selected site of WMMP, has a unique identity being a key location of tallgrass prairie within the Flint Hills Ecoregion. The park's character was identified, captured and analyzed through photography. Key areas and aspects of the site are provided and a detailed analysis shows the possible locations for programming, opportunities for development, and any areas of interest for the projective design.

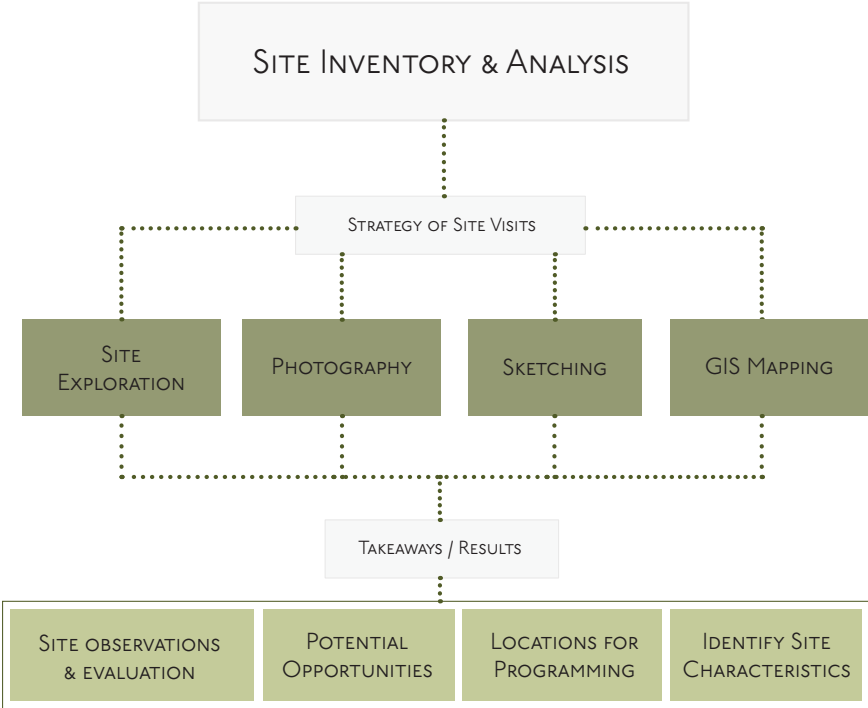


Figure 3.34 Site Inventory & Analysis Diagram (Vialle 2023)



Figure 3.35 Beautiful Monarch Butterfly (Skabelund 2006)



## SITE EXPLORATION

Several site visits and in-depth conversations with a local landscape ecologist and designer (Lee Skabelund) assisted with photography, a suitability/vulnerability study, and an observational analysis. There are two primary vehicular access points: one the north side that leads to the Top of the World Trail and the one towards the south. The main road is currently not paved and is a gravel road that creates a large amount of dust. There are adjacent areas of prairie pasture managed by K-State and residential lots to the north, west, and south. K-II3 is a four-lane highway on the east side of the park. Unpaved walking/hiking trails move through vegetation, riparian buffers, and tallgrass prairie. At the southern part of the site there is a large wooded area that spreads into the surrounding neighborhoods and the Kansas Farm Bureau property.

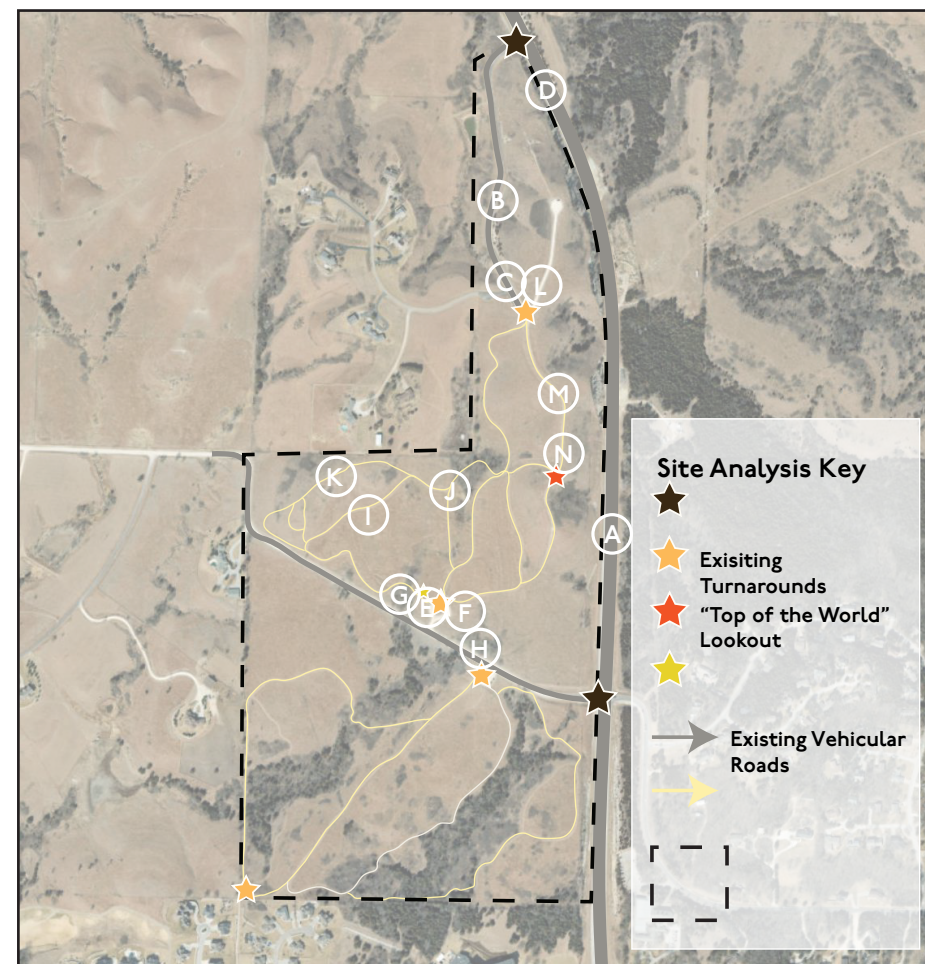


Figure 3.36 Site Exploration Map (Vialle 2023)



Figure 3.37 K-II3 Along Edge of WMMP (Skabelund 2006)

### Observations:

End of cuesta located along the edge of K-II3. The site has a decent amount of distance between the road edge and bottom of cuesta/edge of park.



Figure 3.38 View of Road Along Top of the World Drive (Skabelund 2006)

### Observations:

Interesting views along the drive of K-II3. Some areas are steeper than others and there are varying amounts of shade and vegetation.



**Figure 3.39** WMMP  
Topography and Geology  
(Skabelund 2006)



**Observations:**

The topography for the site is complex and layered. Parts of the site have exposed limestone and shale layers which make for unique walking experiences.

**Figure 3.40** View of WMMP  
along US II3 (Skabelund  
2006)



**Observations:**

Another view from K-II3 where the exposed limestone is seen. Some areas have more vegetation, shade and prairie shrubs, and deciduous and evergreen trees. Eastern Red Cedars are abundant and will overtake the site if it is not regularly burn managed..



**Observations:**

View of roundabout. Nearby areas could serve as a good spot for additional parking due to past disturbances (including for farming prior to acquisition for conservation).

**Figure 3.41** View Towards  
Turnaround (Skabelund  
2023)



**Observations:**

This view looks north towards the site, from the turnaround. This location could potentially be a nature center building site or primary entry since it is already impacted by the gravel drive and parking area, trails, and nearby trampled area (due to frequent foot traffic).

**Figure 3.42** Turnaround  
Island Looking North  
(Skabelund 2023)



**Figure 3.43** Trail Leading to Wooded Area and North Drainage Way (Skabelund 2023)



**Observations:**  
This wooded intermittent stream crossing is near the north turnaround and parking area. Potential options for this area are a trailhead, pollinator and botanical gardens, and a nature center.

**Figure 3.44** Drainage way North of main road (Skabelund 2023)



**Observations:**  
This drainage way is on the north side of the main road and is lightly wooded, with varying levels of shade. This area helps screen the parking area from Marlatt Avenue.



**Figure 3.45** North Trail Cuesta (Skabelund 2006)

**Observations:**  
Cuesta view is beautiful and scenic, heavily vegetated with prairie plants, with scattered trees. Potential opportunities include small shade structures and rest spots.

**Figure 3.46** North Trail & Stream Corridor (Skabelund 2006)



**Observations:**  
The trail north of the stream corridor provides a unique entry to the wooded area, enhancing visitor experience and has a steady 5-8% slope. Views are limited by the dense vegetation (including many tree trunks and shrubs).



**Figure 3.47** Northwest Cuesta (Skabelund 2006)



**Observations:**  
Northwest cuesta has exposed limestone giving the site a natural and prairie feel while exploring this section of rigorous hiking trail.

**Figure 3.48** Main road to Top of the World (Skabelund 2023)



**Observations:**  
This is the main road to the Top of the World viewpoint. Gravel walking path is also drivable but vehicles create dust.



**Observations:**  
This is the main trail to the two primary viewpoints. Some of the trail has overgrown areas, so potential options include better management of the trail edges.

**Figure 3.49** Top of the World Trail (Skabelund 2006)



**Observations:**  
Main views looking east from along the long linear Top of the World vantage points. Views provide a unique experience that allows visitors to see the site and surrounding context.

**Figure 3.50** Top of the World View (Skabelund 2006)



# VULNERABILITY STUDY

## OVERVIEW

For this Master’s Report, a vulnerability site analysis study was analyzed from a past project completed during Dr. Tim Keane’s LAR 470/740 class in 2003. This analysis examined WMMP and the vulnerable ecosystems, slopes, and other features present within the site. The intent of this research was to determine an ideal location for design interventions, based off areas throughout the site that were vulnerable and or applicable based on selected criteria (Lorg et al, 2003).

## FACTORS FOR VULNERABILITY ANALYSIS:

- *Moisture Holding Capacity*
- *Slope Percentages*
- *Drainage Networks*
- *Vegetation Diversity*
- *Visual Quality*

## VULNERABILITY CRITERIA:

### 1. Moisture Holding Capacity (MHC):

The rating of this factor is based on the Riley County Soil Survey. The MHC ratings range from low to moderate to high.

### 2. Slope:

Slopes steeper than 11% were considered high, between 6-10% moderate, and 5% less low.

### 3. Drainage Network (Dn):

Due to the disturbances resulting from development, any ecosystem, located within these two networks were not be considered for development and/or the projective design.

### 4. Vegetation Diversity (Div.):

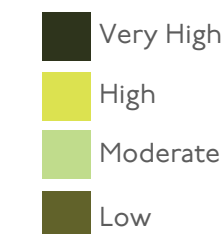
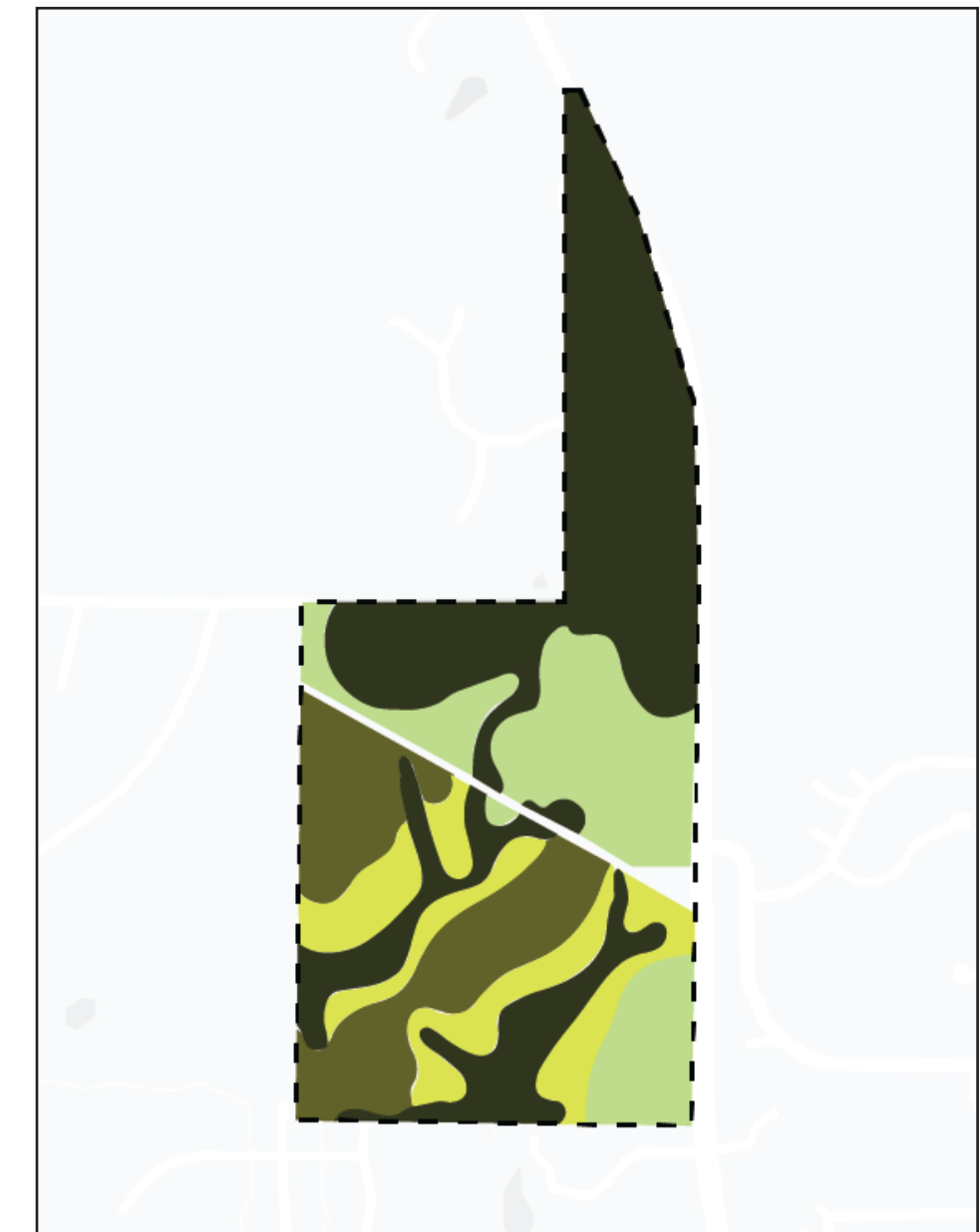
Using the information from 2003 vegetation transects, a rating that ranges from low to moderate to high was assigned.

### 5. Aesthetics:

Each ecosystem was given a rating based on visual quality within that system. Ratings ranged from low to moderate to high to best, based on the overall quality of the view.

Source: (LAR 740 2003; Lorg et al, 2003).

## VULNERABILITY MAP:



**Figure 3.51** Vulnerability Map (Vialle 2023)  
Adapted from: (LAR 740 2006)

Note: Low to moderate ratings are least vulnerable and thus the best locations for new trails, roads, parking & buildings.

VULNERABILITY MATRIX:

| Ecosystem                      | MHC      | Div.     | Slope    |
|--------------------------------|----------|----------|----------|
| Switchgrass<br>(Dry Mesic)     | Moderate | Low      | over 15% |
| Yellow Indiangrass<br>(Mesic)  | Moderate | Moderate | Low      |
| Little Bluestem<br>(Mesic)     | Moderate | Moderate | Low      |
| Dropseed<br>(Dry Mesic)        | Moderate | Low      | over 15% |
| Eastern Red Cedar<br>(Mesic)   | High     | Low      | High     |
| Indiangrass<br>(Dry Mesic)     | Moderate | Moderate | Low      |
| Cordgrass<br>(Mesic)           | High     | Low      | Moderate |
| Little Bluestem<br>(Dry Mesic) | Moderate | Moderate | over 15% |

Table 3.9 Vulnerability Matrix (Vialle 2023) Source from: (Lorg et al 2003).

| Dn  | Aesthetics | Overall Vulnerability Rating |
|-----|------------|------------------------------|
| No  | Best       | Very High                    |
| No  | Moderate   | Moderately vulnerable        |
| No  | Moderate   | Low vulnerability            |
| No  | Moderate   | High                         |
| Yes | High       | Very High                    |
| No  | Moderate   | Low vulnerability            |
| Yes | High       | Very High                    |
| No  | Best       | Very High                    |



# SUITABILITY

## OVERVIEW

For this Master’s report, a suitability site analysis study was analyzed from a past project completed during Dr. Tim Keane’s LAR 470/740 class in 2003. This analysis also examined WMMP and the suitability addressed for different areas of the site. The intent of this research was to determine ideal areas for the placement of new buildings or roads based on applicable and selected criteria. (Long et al, 2003).

## FACTORS FOR SUITABILITY ANALYSIS:

- Shrink/swell potential
- Depth to bedrock
- Slope aspect
- Immediacy to roads & utilities

## SUITABILITY CRITERIA:

### 1. Shrink/Swell Potential (S/SP):

- Low shrink/swell potential = High suitability
- Moderate shrink/swell = Moderate suitability
- High shrink/swell potential = Low suitability

### 2. Depth to Bedrock (DtB):

- 3.5 – 6.0 feet to bedrock = High suitability
- 2.0 – 3.4 feet to bedrock = Moderate suitability
- 0 – 1.9 feet to bedrock = Low suitability

### 3. Aspect (access to winter sunlight):

- Southwestern aspect = High suitability
- Southeastern aspect = Moderate suitability
- Northeastern aspect = Low suitability

### 4. Access to Utilities:

- Utilities adjacent to ROW = High suitability
- Utilities close to site = Moderate suitability
- Utilities considerably distant = Low suitability

Source: (LAR 740, 2003; Long et al, 2003).

# SUITABILITY MAP:

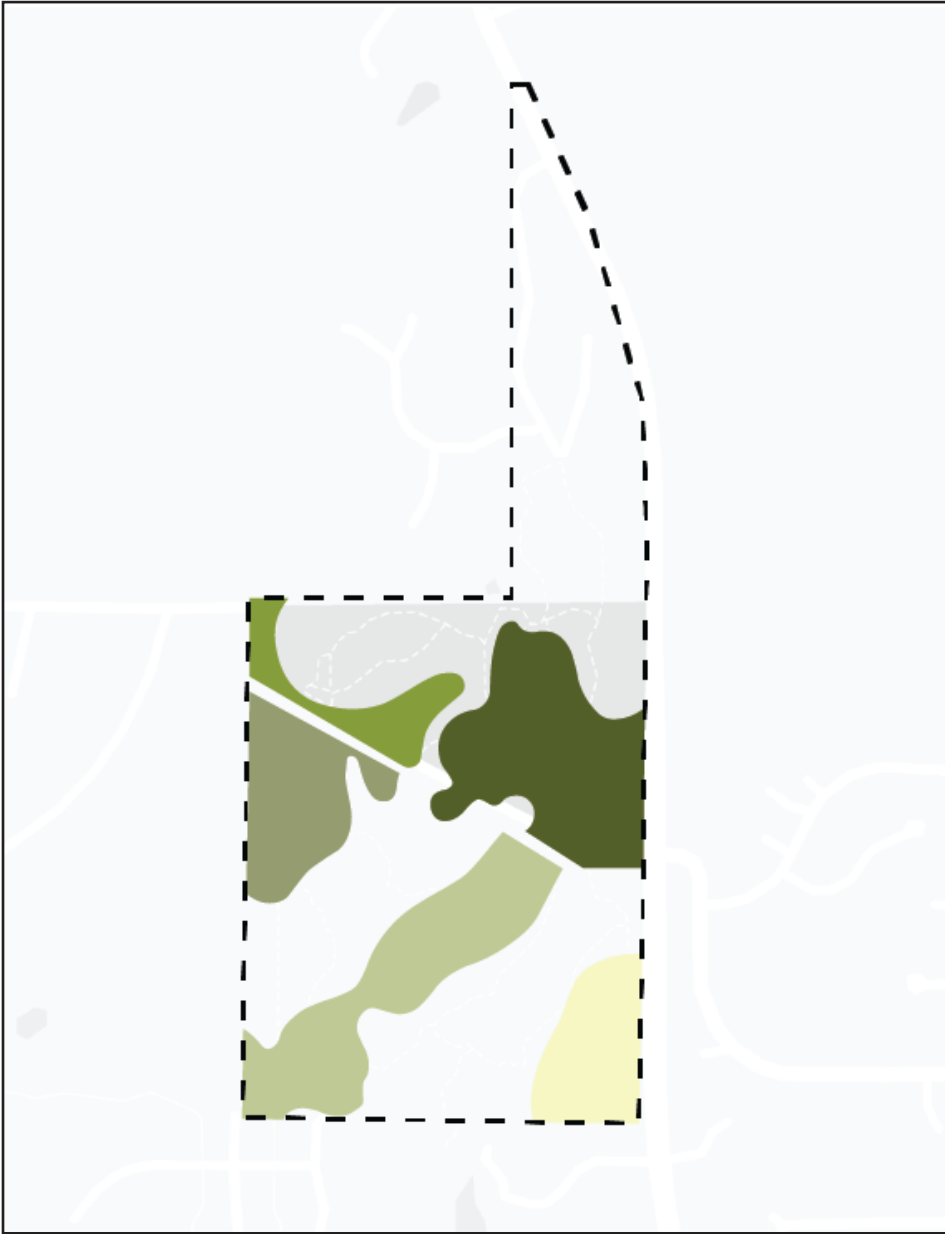


Figure 3.52 Suitability Map (Vialle 2023)  
Adapted from: (LAR 740 2003)

- Location A | Medium
- Location B | Medium/Low
- Location C | Medium/High
- Location D | Medium/High
- Location E | High (best place for new roads, parking & buildings)

SUITABILITY MATRIX:

| Location | S/Sp     | D/Db     | Aspect   |
|----------|----------|----------|----------|
|          |          |          |          |
| A        | Moderate | Moderate | Moderate |
| B        | Moderate | Moderate | Low      |
| C        | Moderate | High     | Moderate |
| D        | Moderate | High     | Moderate |
| E        | Low      | High     | High     |

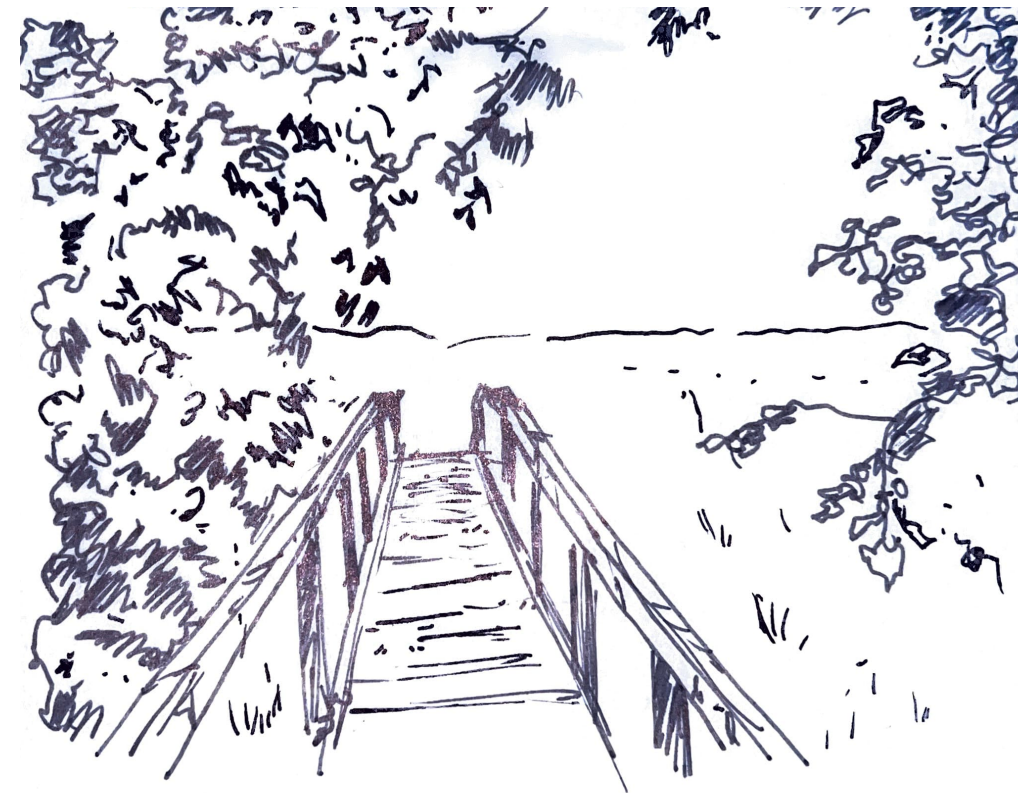
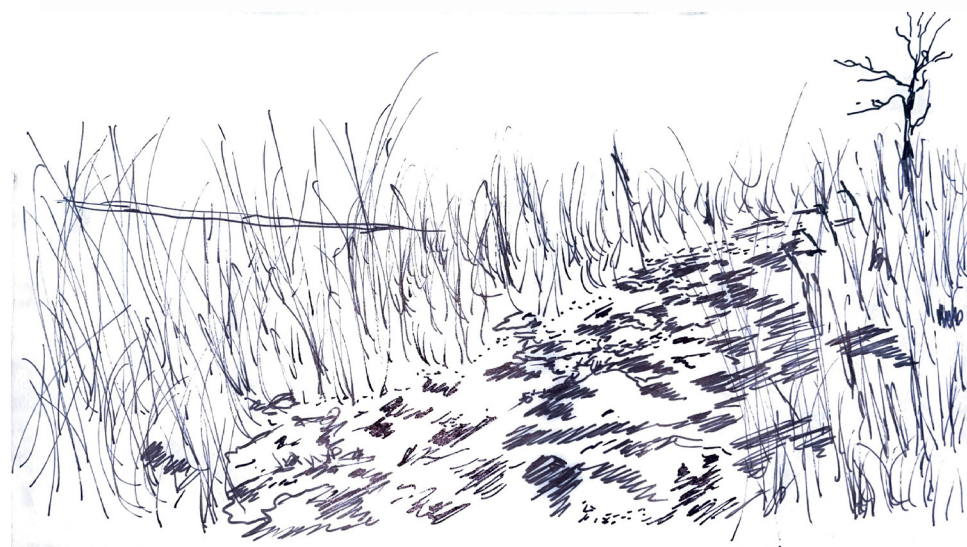
Table 3.10 Suitability Matrix (Vialle 2023) Source from: (Lorg et al 2003).

| Utilities |          |           |        | Overall Utility Rating | Overall Suitability |
|-----------|----------|-----------|--------|------------------------|---------------------|
| KGE       | Water    | Telephone | Access |                        |                     |
| High      | Low      | Moderate  | High   | Moderate               | Moderate            |
| Moderate  | Moderate | Moderate  | High   | Moderate               | Moderate Low        |
| High      | High     | High      | High   | Low                    | Moderate/High       |
| High      | High     | High      | High   | Low                    | Moderate/High       |
| High      | Low      | Moderate  | High   | Moderate               | High                |

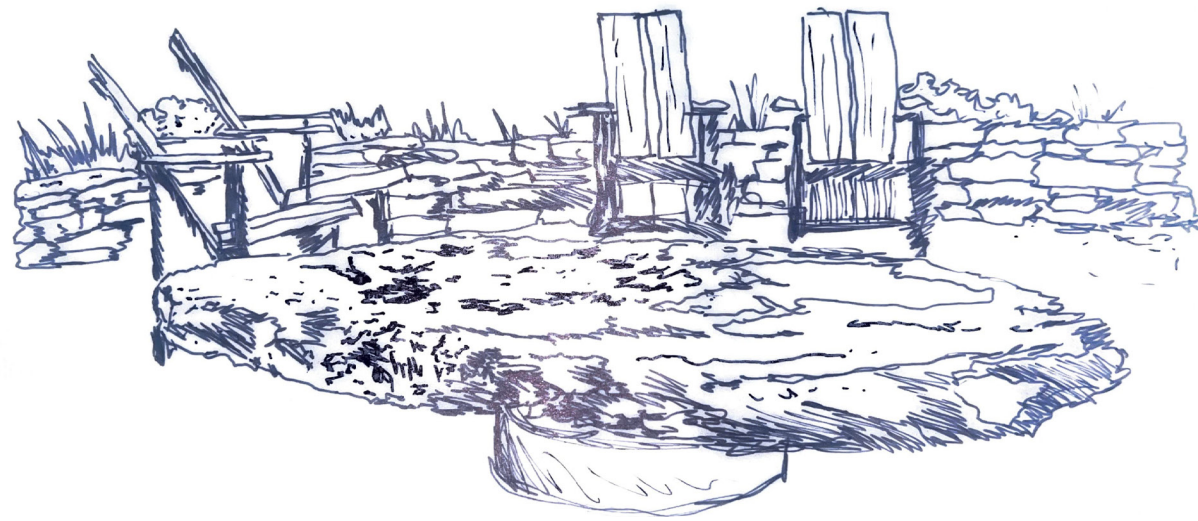
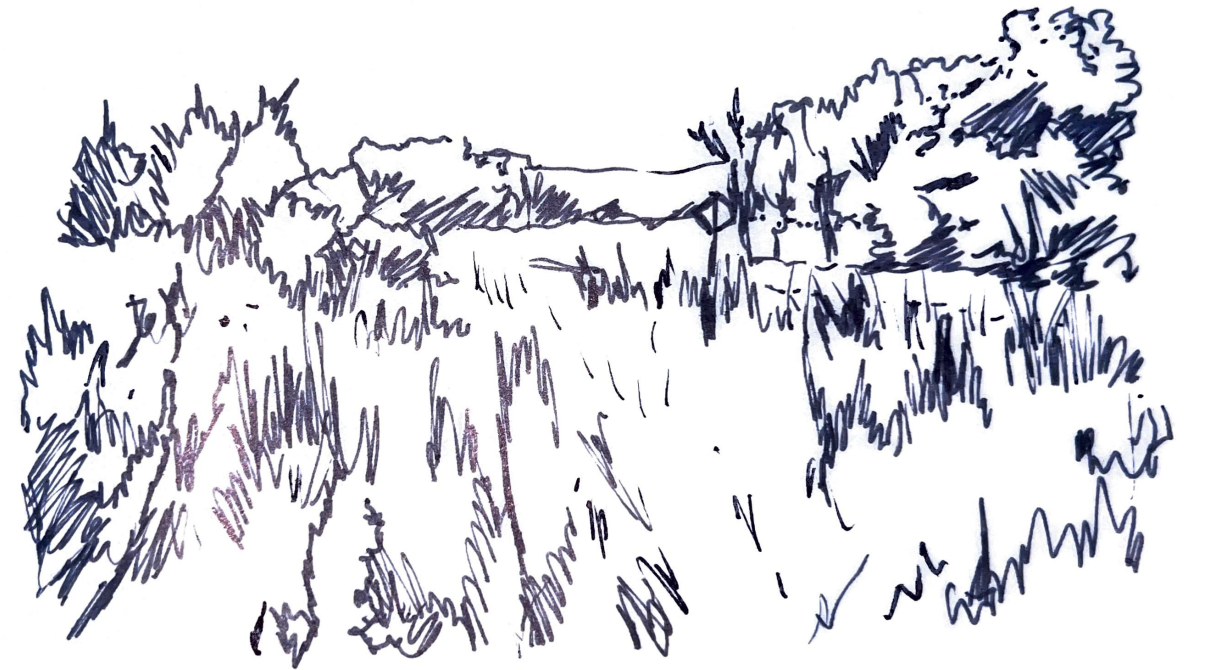


## SKETCHING

A very effective and creative approach for site inventory and analysis is to explore and sketch out things seen on site. This is a useful tool due to its ability to capture existing site conditions in a unique way, which helps to envision potential design interventions. Sketching allows the mind to wander and gives the eyes a chance to speak to something that isn't fully explainable. Throughout my sketching process, I looked for interesting views, places of importance and any areas on site where I found rest, intrigue and curiosity. *(Historic photos and precedent images were also used for some sketches; all sketches by Author)*



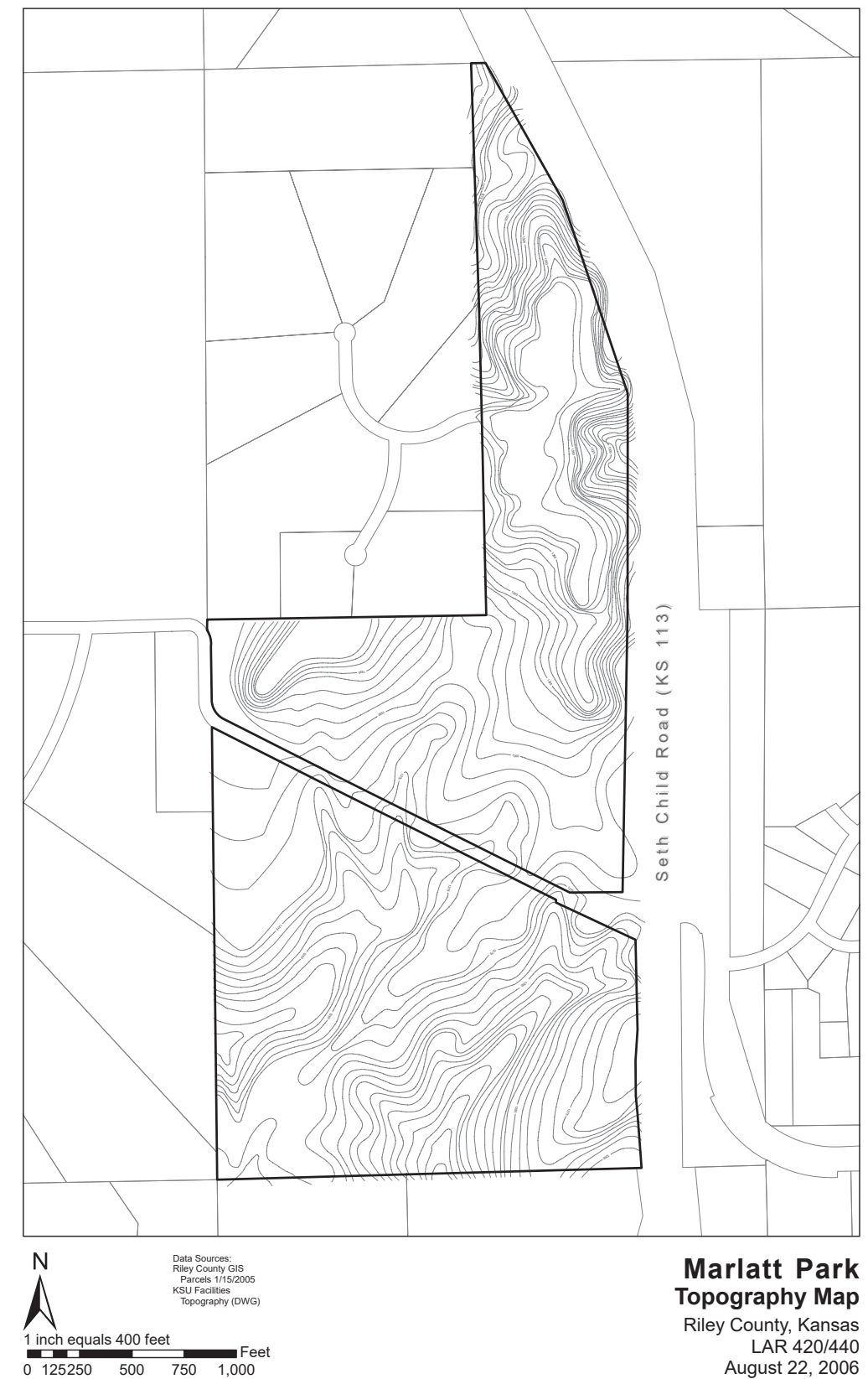




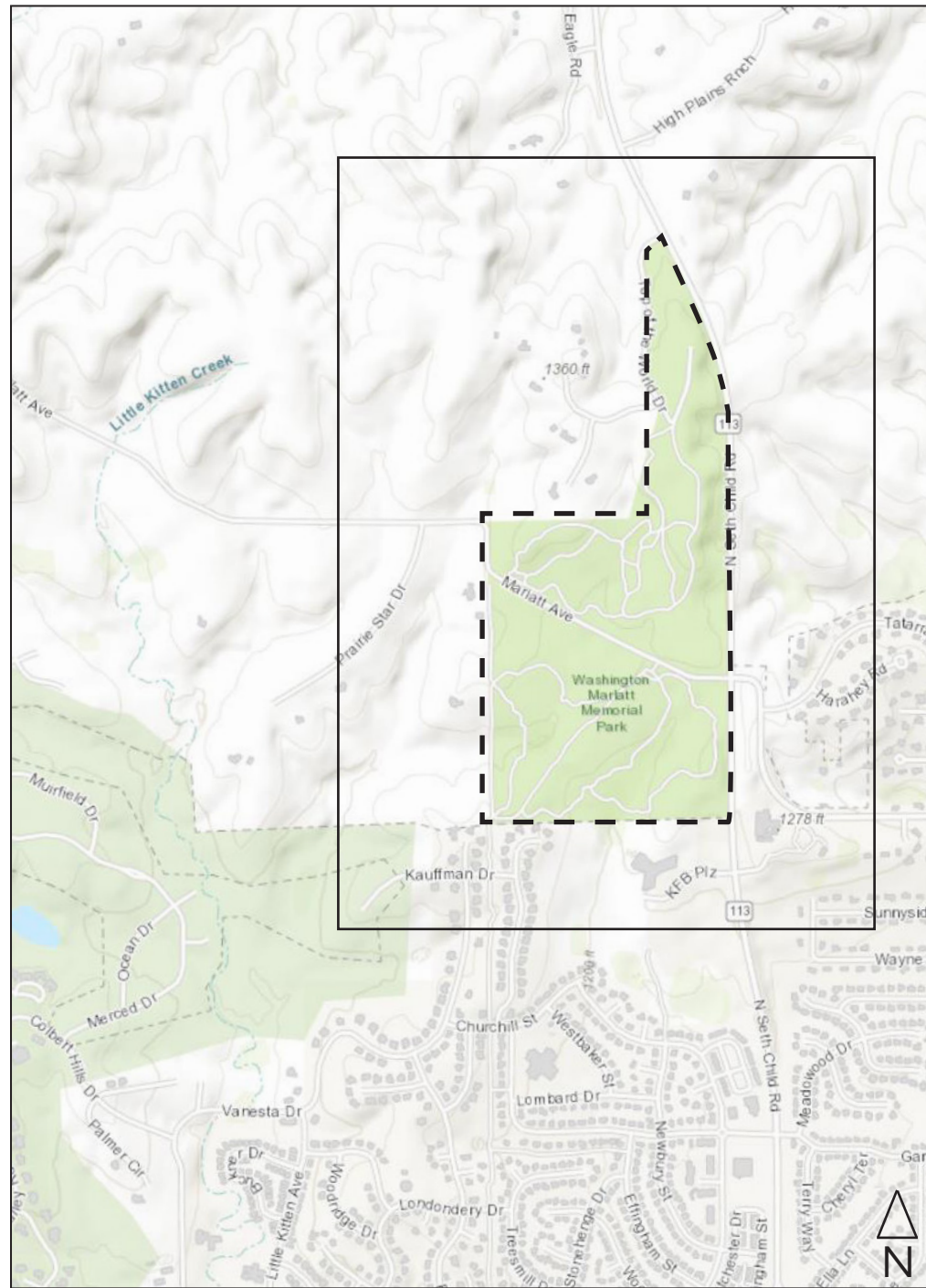


## GIS MAPPING

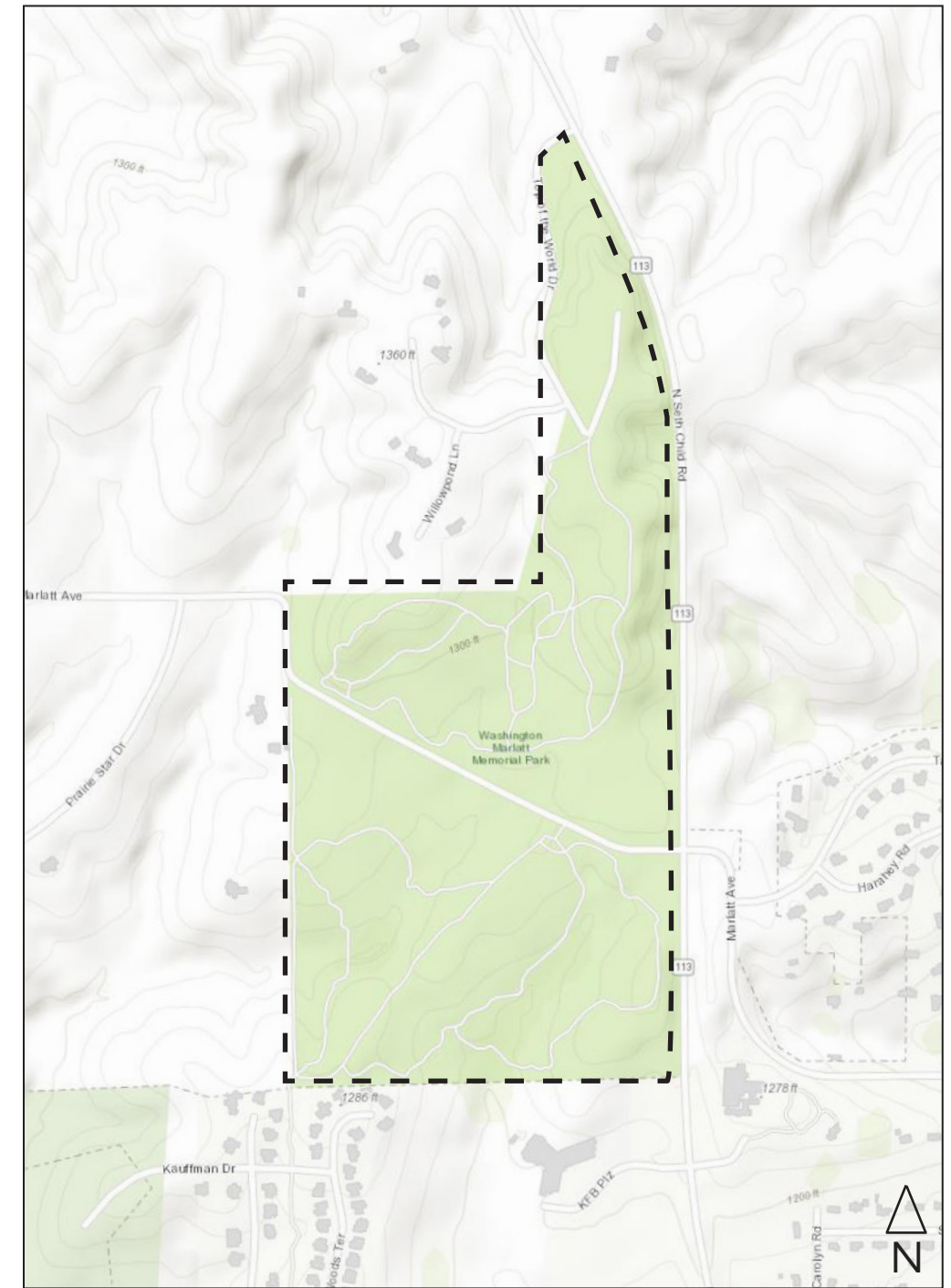
An effective technique for site inventory and analysis is to explore the site's integrity and characteristics through GIS mapping. GIS is a computer program that systematically uses geographical data to help identify and manages different aspects and features unique to locations. GIS data enable one to analyze biophysical and other mapped information relating to location, boundaries, zoning, elevation changes, geographic names, hydrography, land cover, orthoimagery, vegetation, structures, infrastructure, and transportation. This program is often used by landscape architects, geographers, and professionals in earth sciences, biology, and resource management.



**Figure 3.53** Marlatt Park Topography Adapted from: (LAR 740 2006)

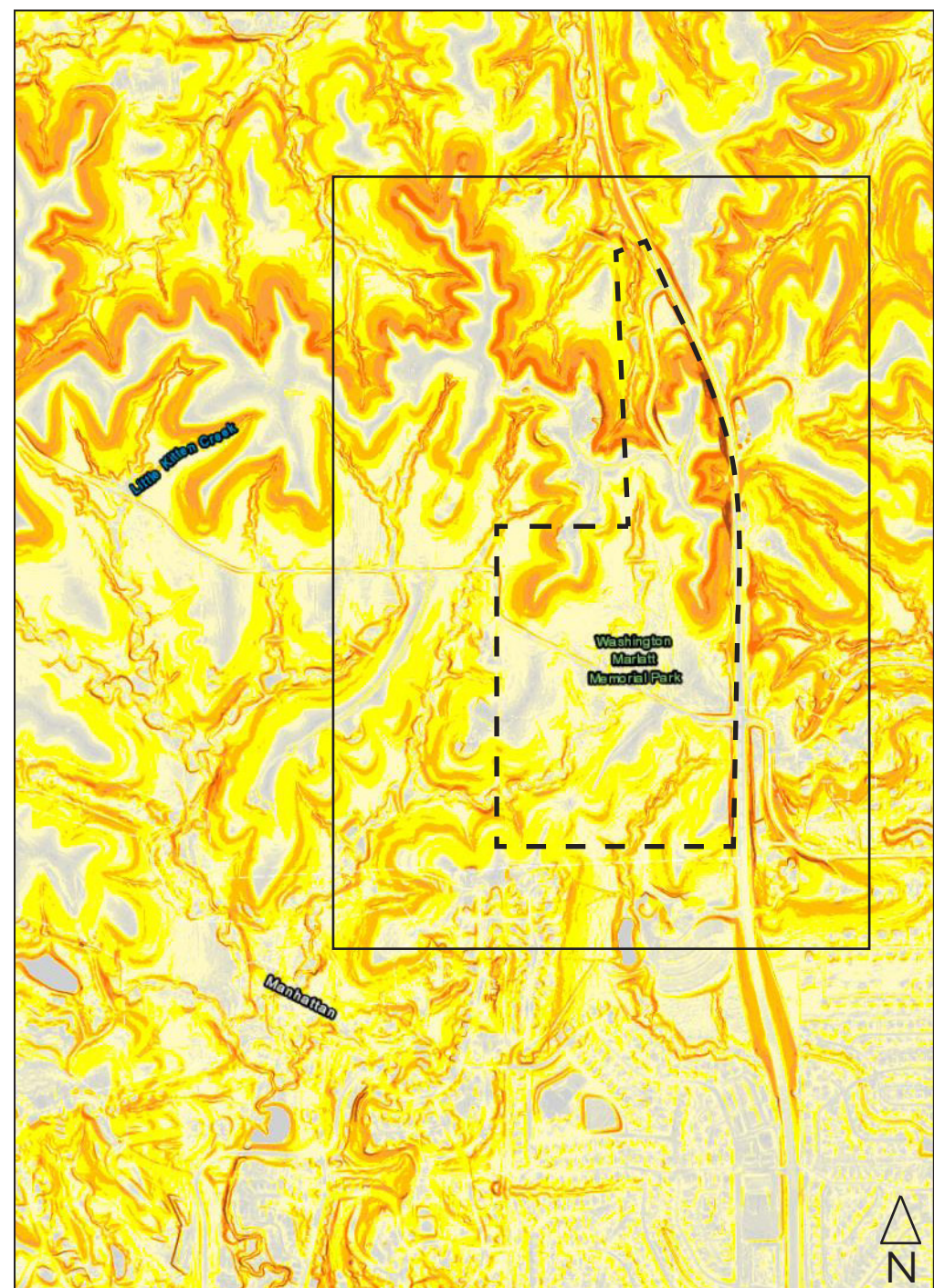


**Figure 3.54** Site Context Topography & Contours (Vialle 2023) Source: (ArcGIS 2023)

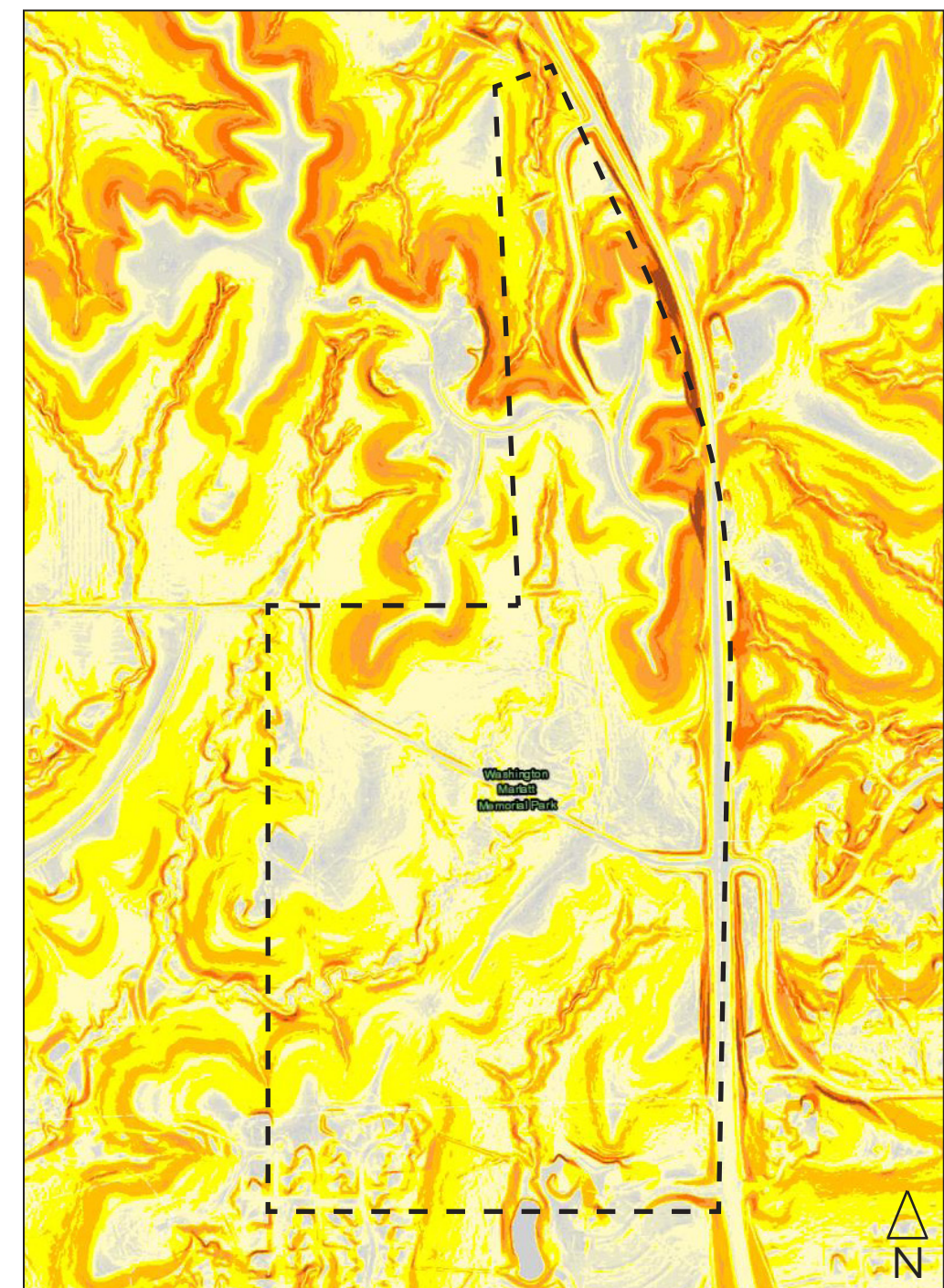


**Figure 3.55** Site Topography & Contours (Vialle 2023) Source: (ArcGIS 2023)



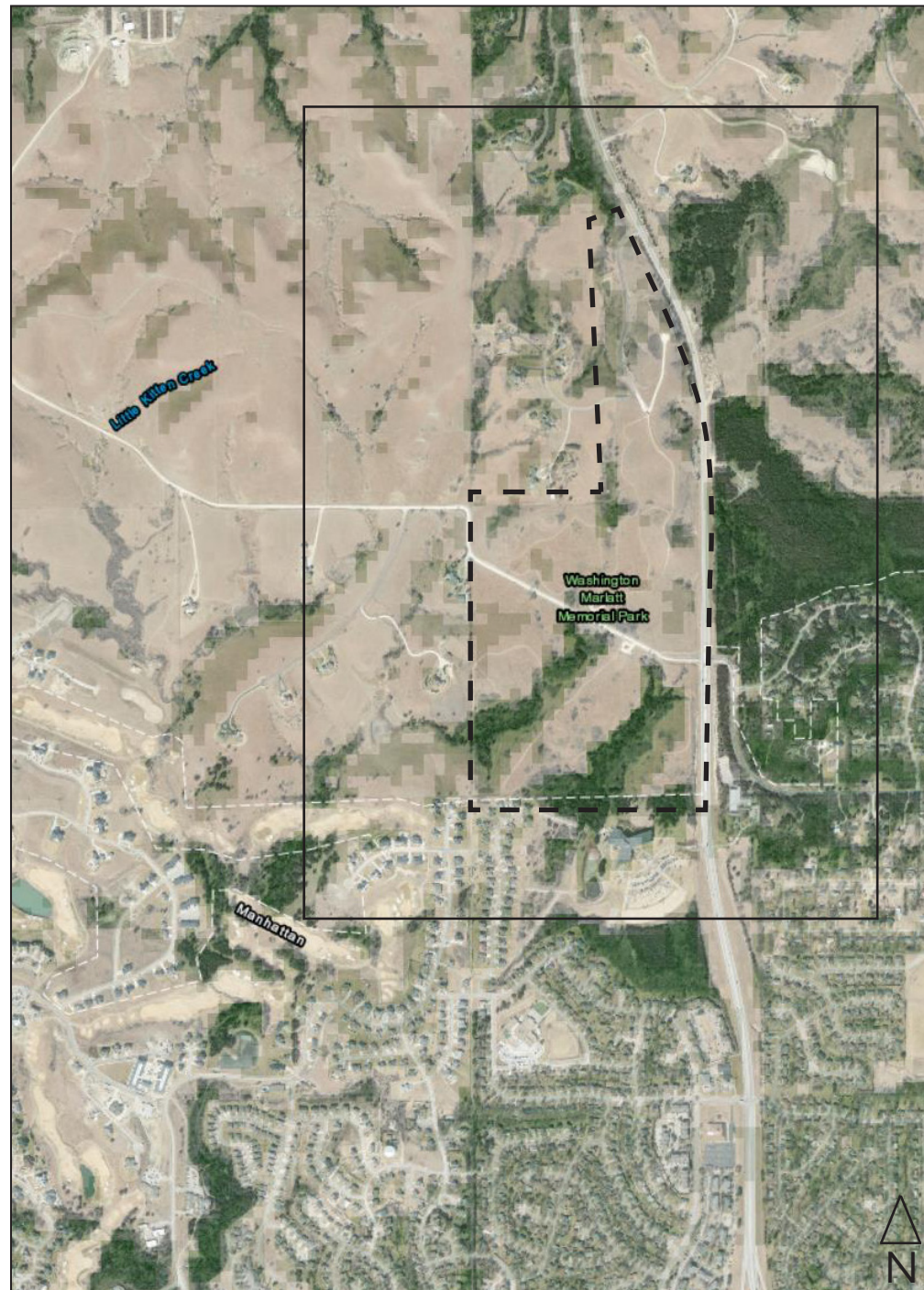


**Figure 3.56** Site Context Slope (Vialle, 2023) Source: (ArcGIS, 2023)



**Figure 3.57** Site Slope (Vialle, 2023) Source: (ArcGIS, 2023)





**Figure 3.58** Site Context Vegetation (Vialle 2023) Source: (ArcGIS 2023)



**Figure 3.59** Site Vegetation (Vialle 2023) Source: (ArcGIS 2023)



## SITE INVENTORY AND ANALYSIS CONCLUSION

Washington Marlatt Memorial Park has potential for ecotourism expansion and educational programming. Most of the main aspects of the site lead towards a conversation and preservation value through two different designs (*see Chapter 4*). Design considerations include:

1. Views connecting the beauty of the site and surrounding context, to enhance the human-nature connection.
2. The degraded and disturbed areas are primary locations for potential design interventions (additional features)
3. Areas vital to the site, such as high quality tallgrass prairie, drainage corridors, and steeper slopes, are to be preserved, left alone or or by employing low-impact design employing Low-Impact Design techniques.
4. Use existing trails as a guide for both nature center options, as existing trails are to be utilized and expanded on to strengthen the programming.
5. Implement educational programming, meaningful signage, in association with nature center locations.





Figure 4.0 Fenceline Konza (Hammel 2020)

# Projective Design

## contents

- overview
- project boundaries
- surrounding context
- site adjacencies
- site inventory
- site conditions analysis
- site constraints & opportunities
- design approach
- schematic design
- washington marlatt memorial park master plan
- spatial analysis
- design components
- design strategies
- conceptual master plan



# 4 PROJECTIVE DESIGN

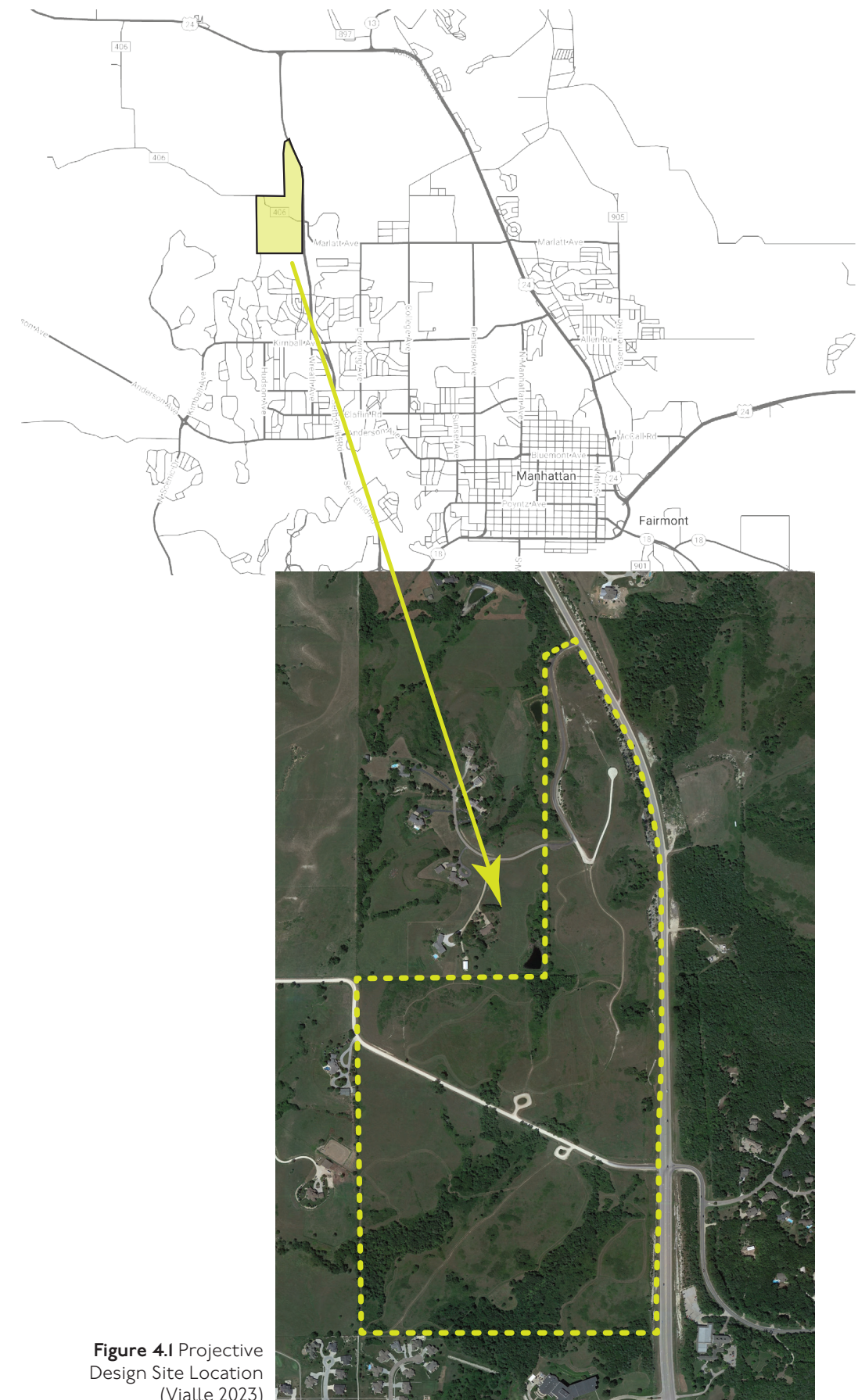
The projective design is the process of bringing ideas from the preceding chapters and sections: background, methodology precedent studies, and site inventory and analysis (*refer to chapters 2 & 3*) to inform design decisions related to my selected site WMMP and program (a low-impact Nature Center). These areas of research are all connected to the projective design process for developing an environmental education-focused design with an emphasis on a nature center facilities and education and recreation programs.

The structure of this projective design takes the form of two conceptual designs that have different contributions to the selected site: WMMP. The two designs are interrelated and have a varying level of impact, revolving around the health, quality, vulnerability, of specific areas within the site. With this design strategy, opportunities, programming and locations for design implementations were considered to have two different themes. The first is the lowest impact conceptual design focusing on using existing site conditions and enhancing programming with facilities that utilize degraded and disturbed areas. The second conceptual design also uses disturbed areas for nature center facilities while providing a more enhanced site design for expanded day-use and low-impact nature center education and recreation programming. These two focused design strategies can help guide future development for the site by helping decision-makers think through two kinds of design approaches and the level impact desired for the site.

## PROJECT BOUNDARIES

The research and projective design primarily focus new structures, parking, and activities on the 92 acres on the north side of the total 164 acre park. The general site context has residential areas, government property, educational facilities, and transportation access. The site contains burned and managed prairie, and mostly wooded riparian areas, a gravel road and gravel, donut-shaped parking areas as the main areas of disturbance

**Owner / Management:** City of Manhattan Park & Recreation Department and Kansas State University



**Figure 4.1** Projective Design Site Location (Vialle 2023)

# SURROUNDING CONTEXT

Surrounding context includes three different types of residential neighborhoods, the Kansas Farm Bureau, and several schools (as shown in Figure 4.2). The primary locations are at the corners and entries of the site. Connections include the Hudson Nature Trail for ease of access to the Frank Bergman Elementary School and then entry points near the northern neighborhoods.

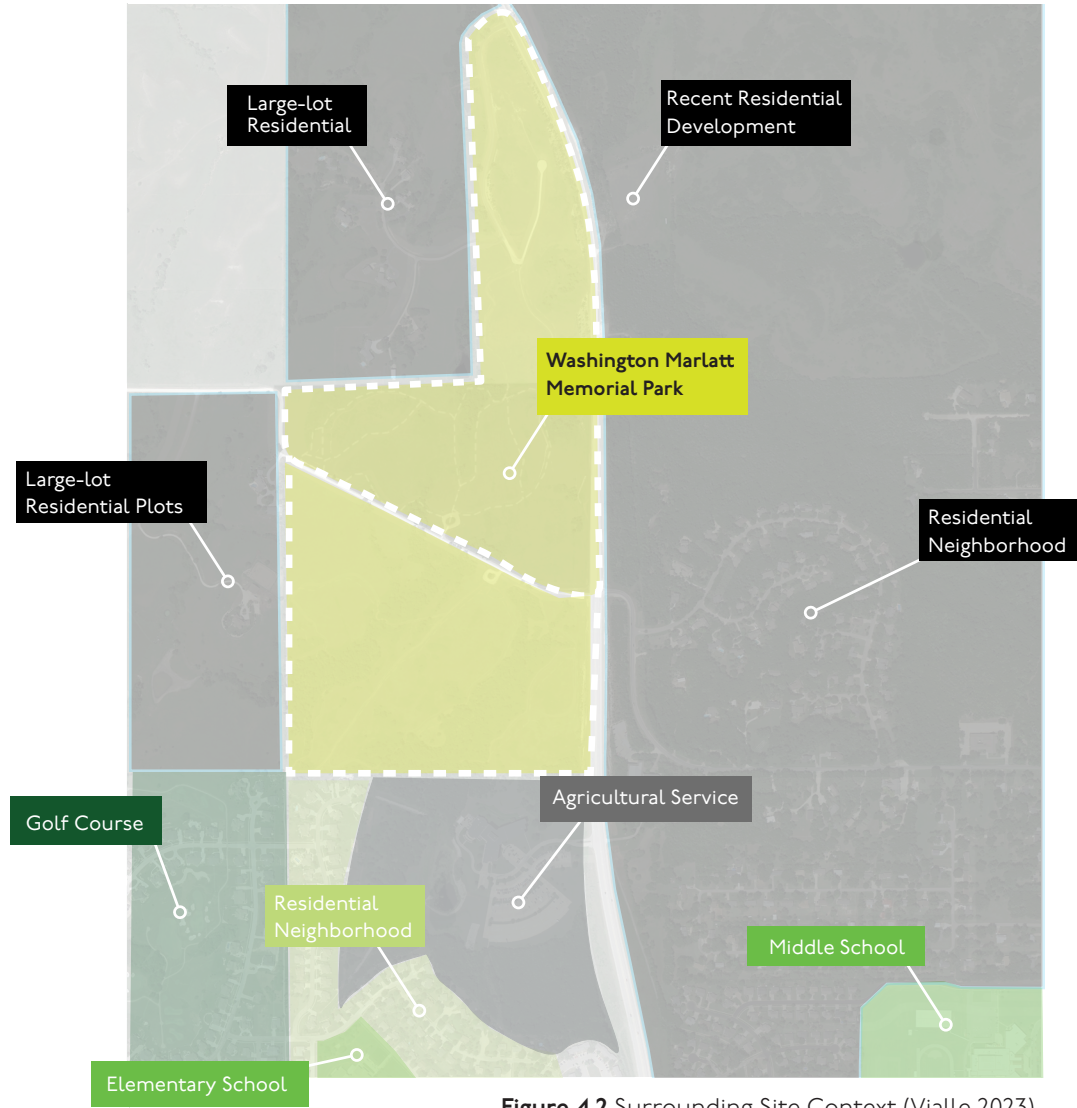


Figure 4.2 Surrounding Site Context (Vialle 2023)

# SITE ADJACENCIES

The site is located on the outer edge of the City of Manhattan, hugging Seth Child Road (K-133) within a semi-rural area. There is surrounding farmland, high-end neighborhoods, other residential homes, a church, schools, the preserved and managed prairie, intermittent stream corridors, and various prairie ecosystem types on-site. Connections to the nearby school, trails, and other surrounding context are identified in Figure 4.3, Site Adjacencies.



Figure 4.3 Site Adjacencies (Vialle 2023)



SITE INVENTORY

A site inventory and analysis was conducted for the site, and during this process site visits, GIS mapping, and assessment of aerial imagery, NRCS Soil Survey Data (NRCS 2023), and Riley County Zoning Data (Riley County 2023) were completed. The key factors that were analyzed include: soils, existing hydrology, circulation patterns, existing burning management, and existing vegetation. These conditions informed the site design projections.

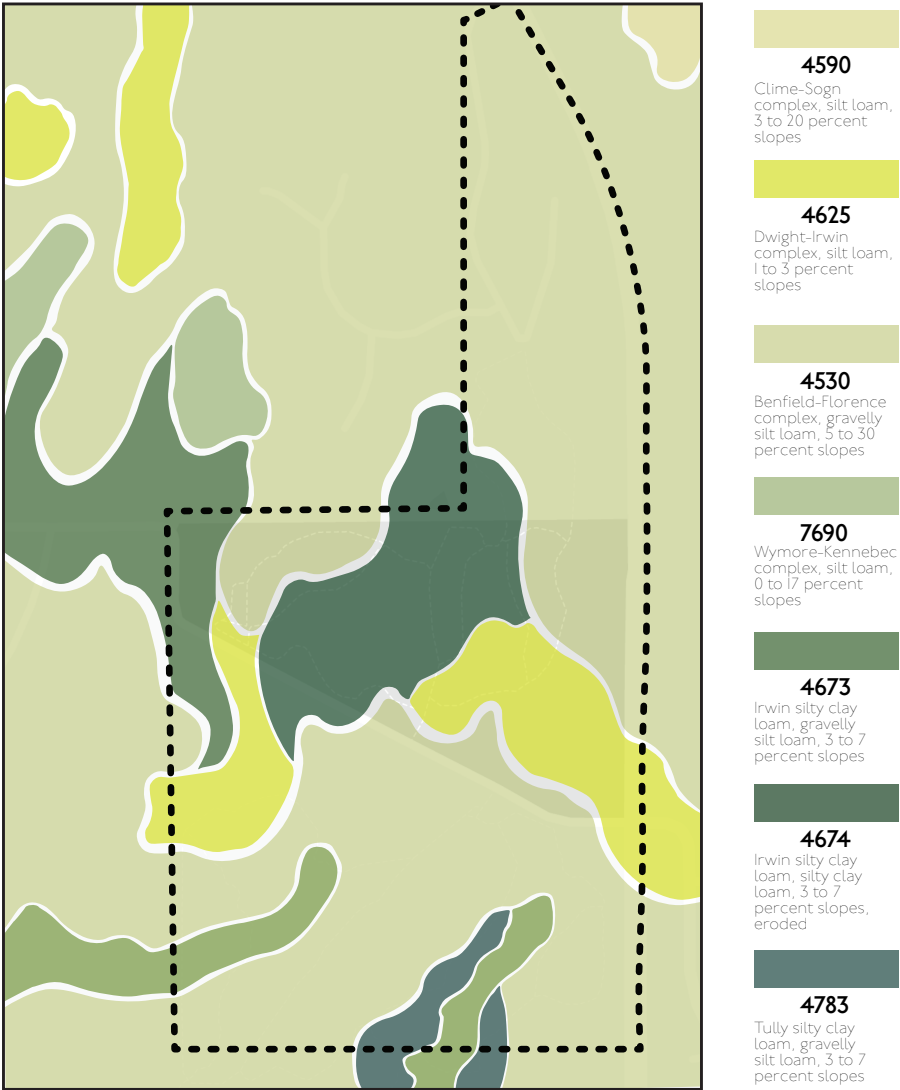


Figure 4.4 Soil Survey Map (Vialle 2023)

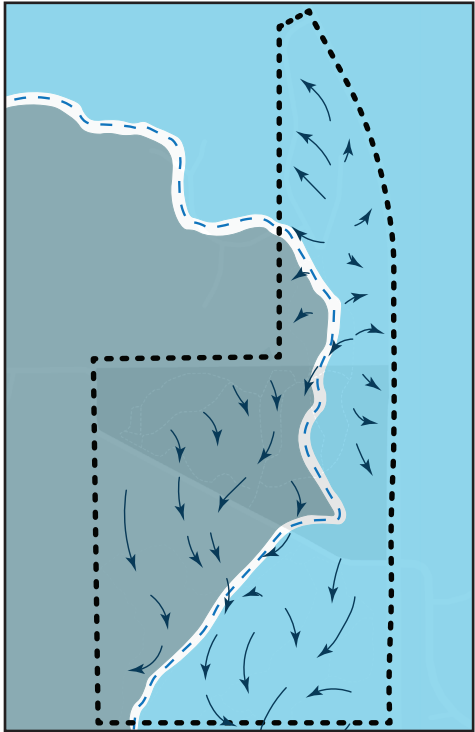


Figure 4.5 Hydrology Pattern (Vialle 2023)

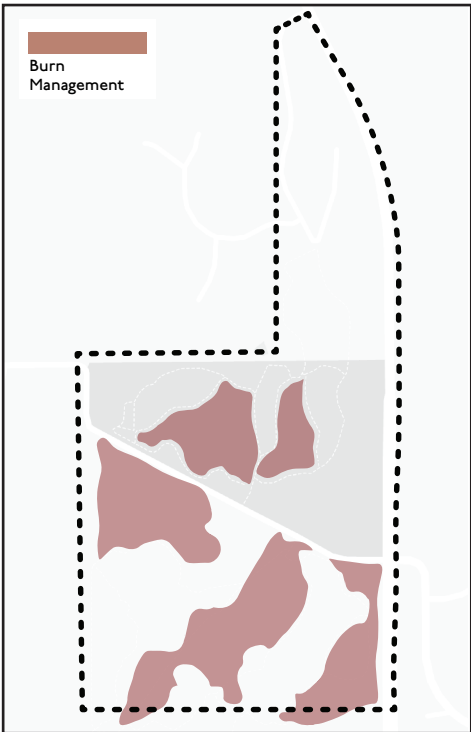


Figure 4.6 Soil Survey Map (Vialle 2023)

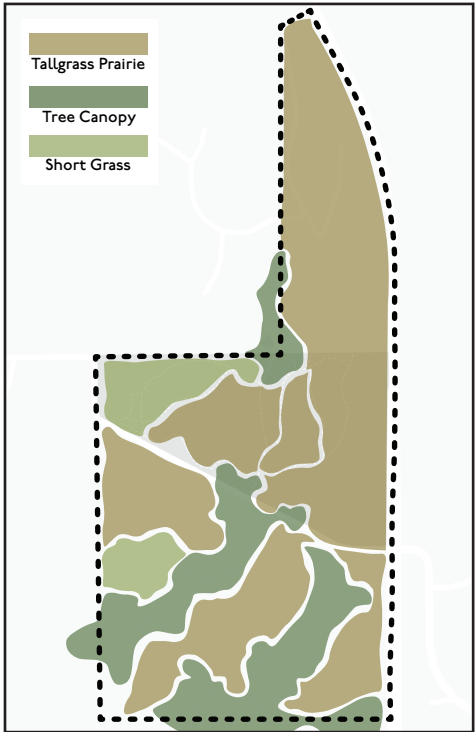


Figure 4.7 Existing Vegetation (Vialle 2023)

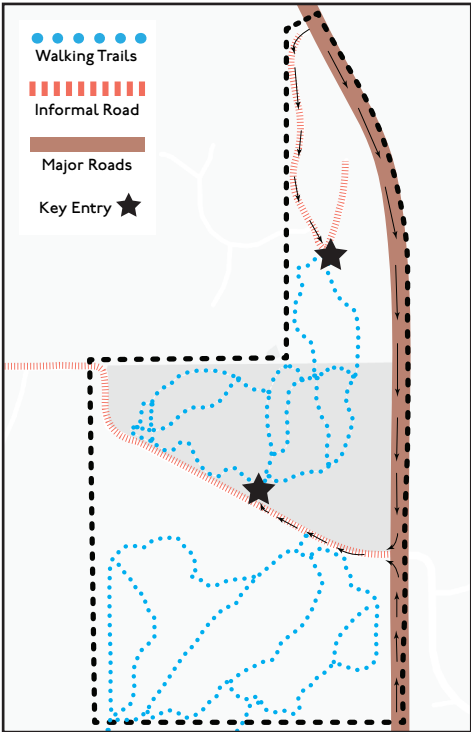


Figure 4.8 Circulation Patterns (Vialle 2023)

## SITE CONSTRAINTS & OPPORTUNITIES

### CONSTRAINTS

The central focus of this projective design is to enhance a site which is known for nature-based exploration and preserved tallgrass prairie. The most significant constraints associated with the site are that the existing tallgrass prairie is semi-disturbed and that there is a lack of environmental educational programming. Another constraint is the lack of successful connections to areas within the park and within the site adjacencies. With these constraints in mind, opportunities in specific areas are considered like new programming, facility locations, and creation of environmental education activities.

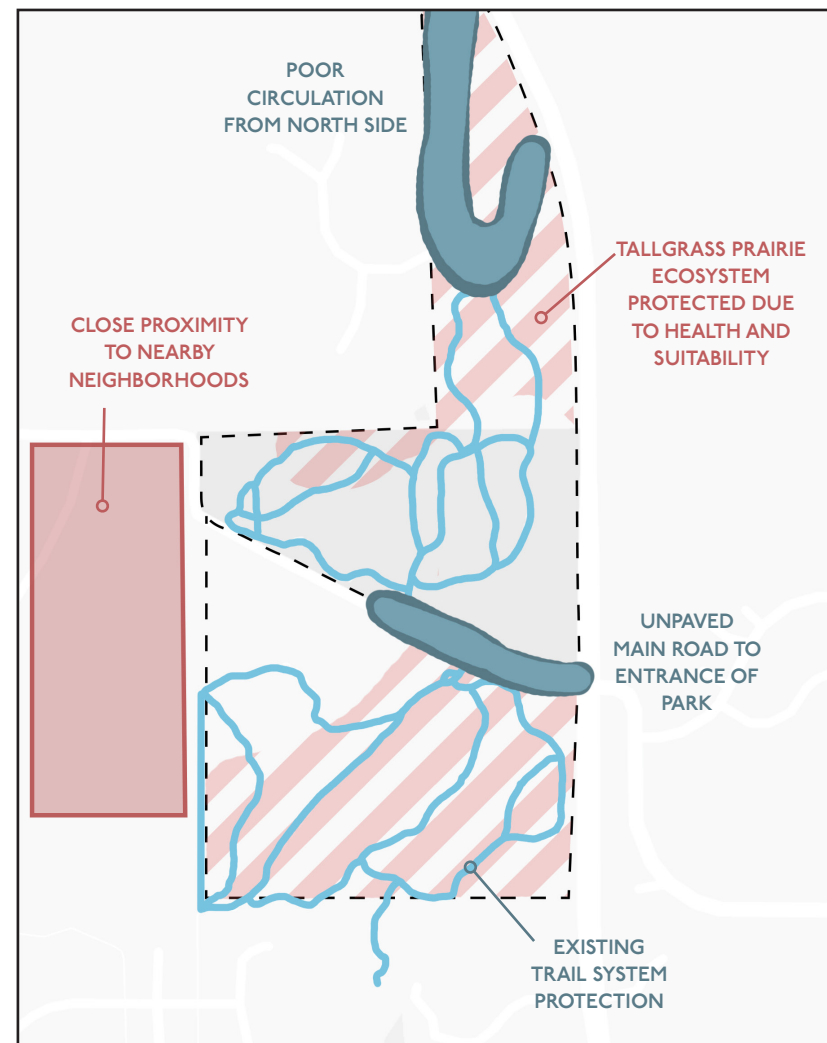


Figure 4.9 Site Constraints Map (Vialle 2023)

### OPPORTUNITIES

The research and projective design focuses on the 92 acres on the north side of the total 163.8 acres. This park is located in the northwest part of the City of Manhattan in Riley County, Kansas. The general site context has residential areas, government property, educational facilities, and transportation access which is linked to various opportunities. The site contains hiking trails, burned and managed prairie, riparian areas, and a gravel road as the main forms of access but as seen in Figure 4.10, various areas have opportunities that could be improved.

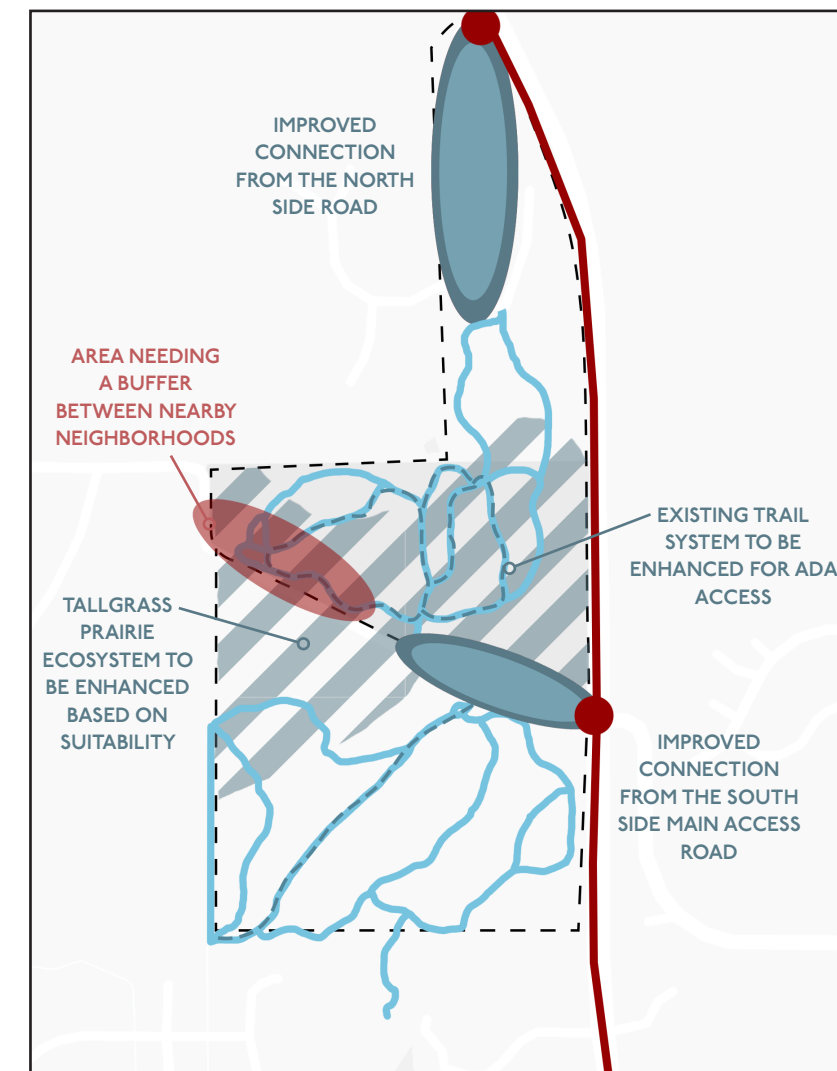


Figure 4.10 Site Opportunities Map (Vialle 2023)



## DESIGN APPROACH

This projective design was influenced by the programming and architectural style of the Shangri La Nature Center located in Orange, Texas (see *Chapter 3: Precedent Studies*). The following are the factors considered for this design approach.

1. For successful educational experiences, determine the best way to design a beneficial indoor/outdoor relationship.
2. Use glass, large windows and viewing decks in the designs of the nature / new site facilities to enhance the visual connections to the surrounding landscape, but be sure to employ features that will keep birds from crashing into glass windows.
3. Multiple buildings considered for indoor/outdoor classrooms, mixed-use spaces, areas for children's learning, and nature educational spaces.
4. Enhancement of existing trails on-site, employing tactics that promote conservation of intact natural areas and excellent prairie and invasive species management strategies.
5. Improved and new outdoor programming opportunities are to be implemented for more nature-based experiences which enhance the human-nature connection.
6. Consider: use of disturbed areas for new buildings, ADA trails, and for bus and smaller vehicle, turnaround, drop-off and ADA access, and parking.

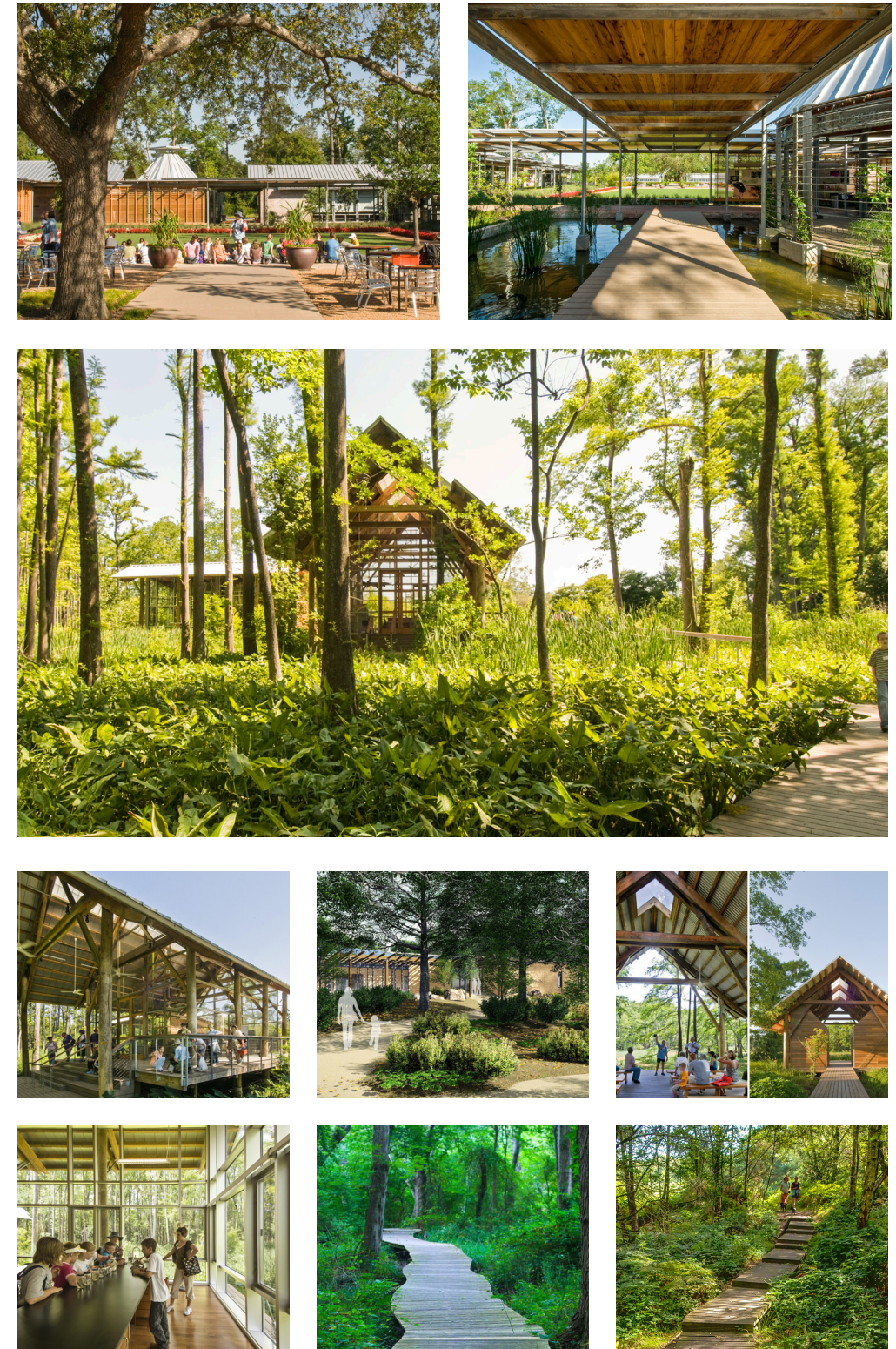
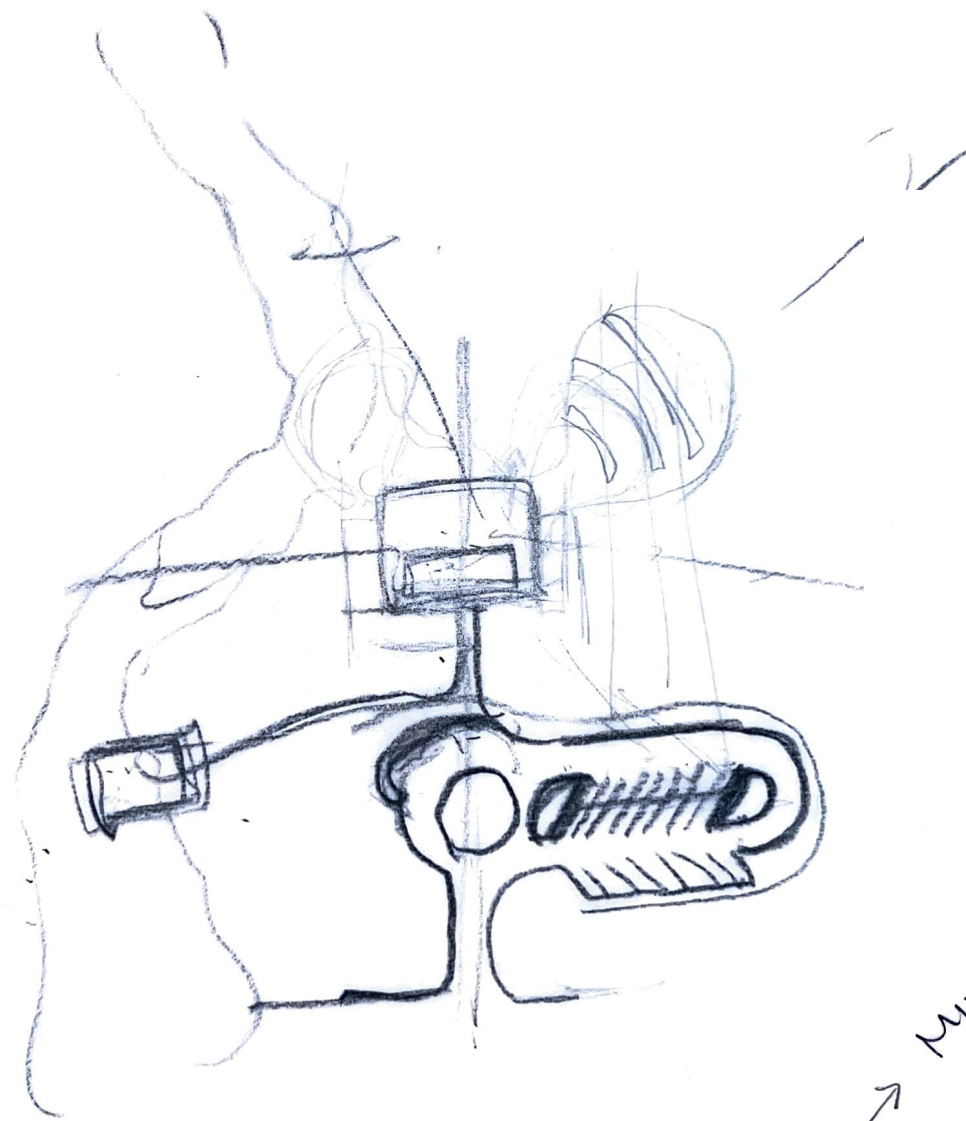
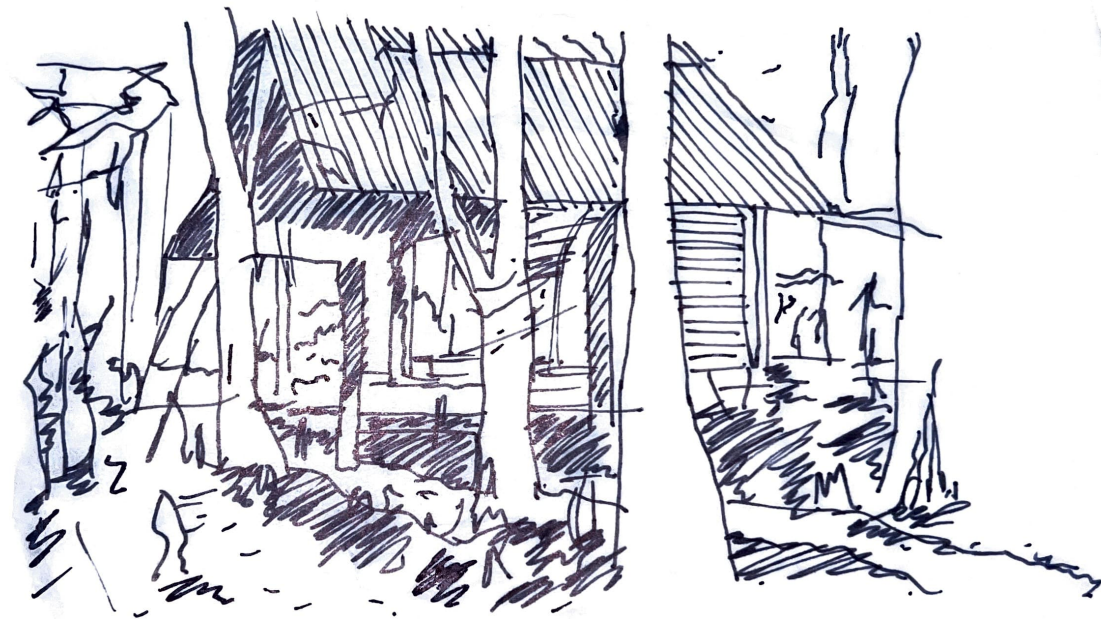


Figure 4.10 Design Inspiration (Various Authors)



## SCHEMATIC DESIGN

Following the site inventory and analysis process, potential design solutions were explored through schematic design sketching. This process is based upon the research throughout Chapters 2 and 3, exploration of site, imagery and using the established design guidelines and evaluations from the site inventory and analysis process.



→ MIXED/OPEN  
+  
→ CLASSROOM/  
VISITORS/ EDUCATION  
SPACE  
→ OUTDOOR ED.  
COURT  
+



2000+ ENERGY  
→ CAPTURE (SOLAR)  
→ BATTERY STORAGE  
→ WATER CAPTURE  
(RE-CIRCULATED)

COMPOSTING  
TOILETS  
- USE TRAILS

LOW-IMPACT /  
- IMPACT OPTION

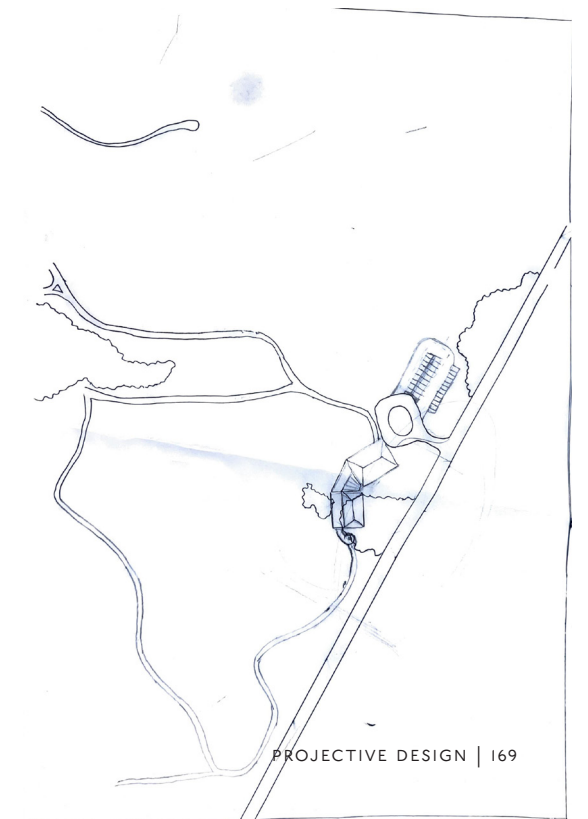
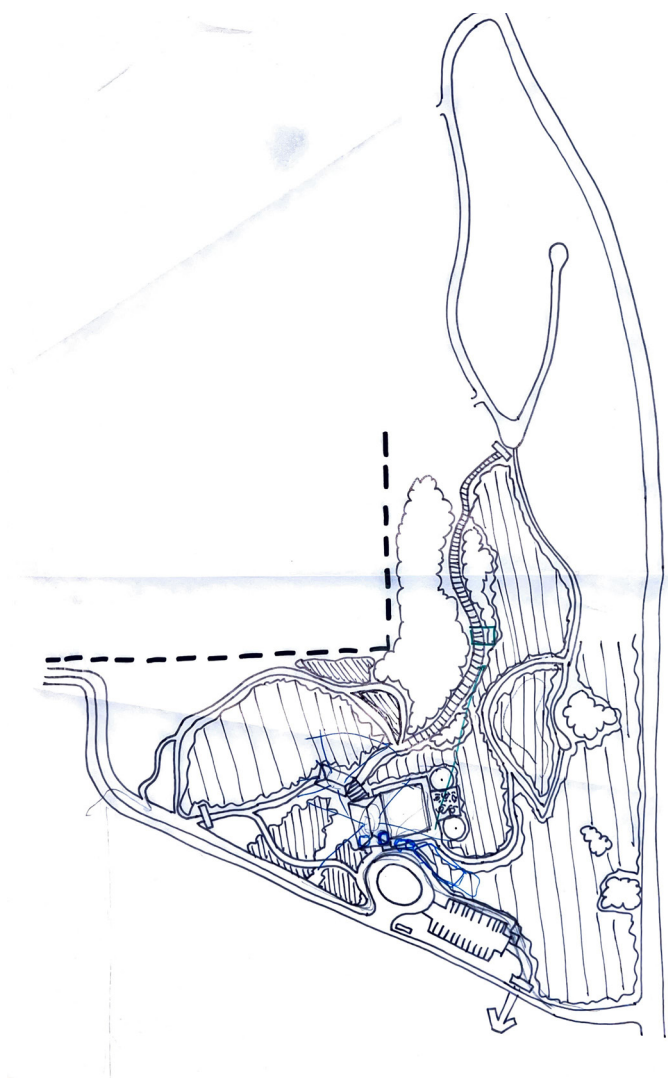
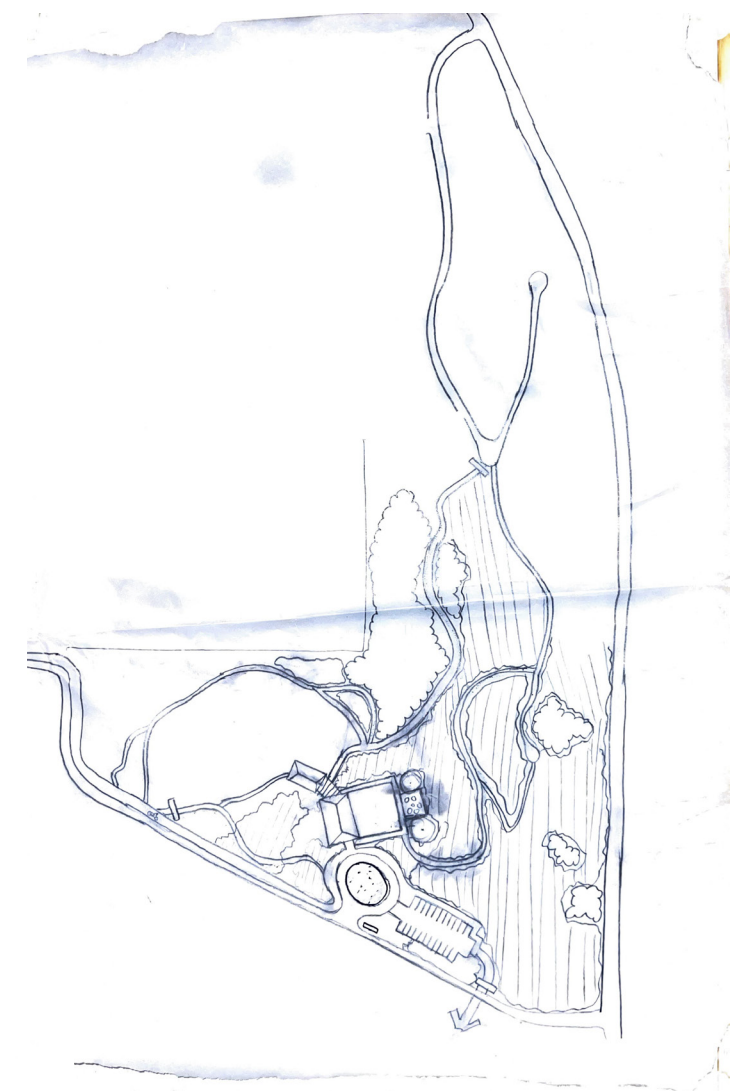
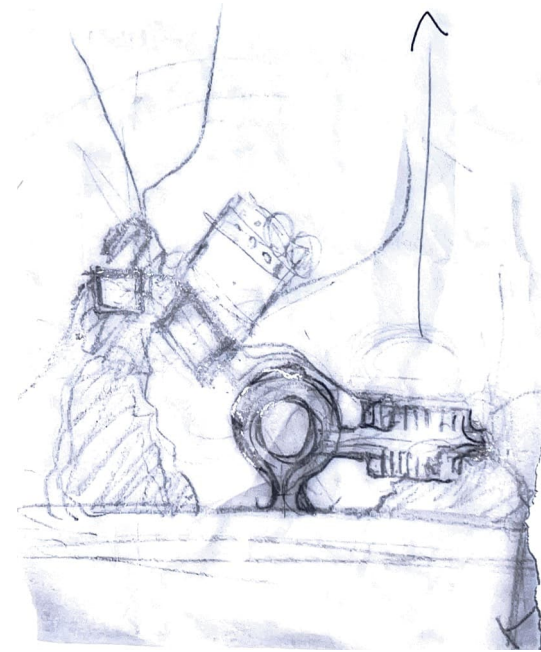
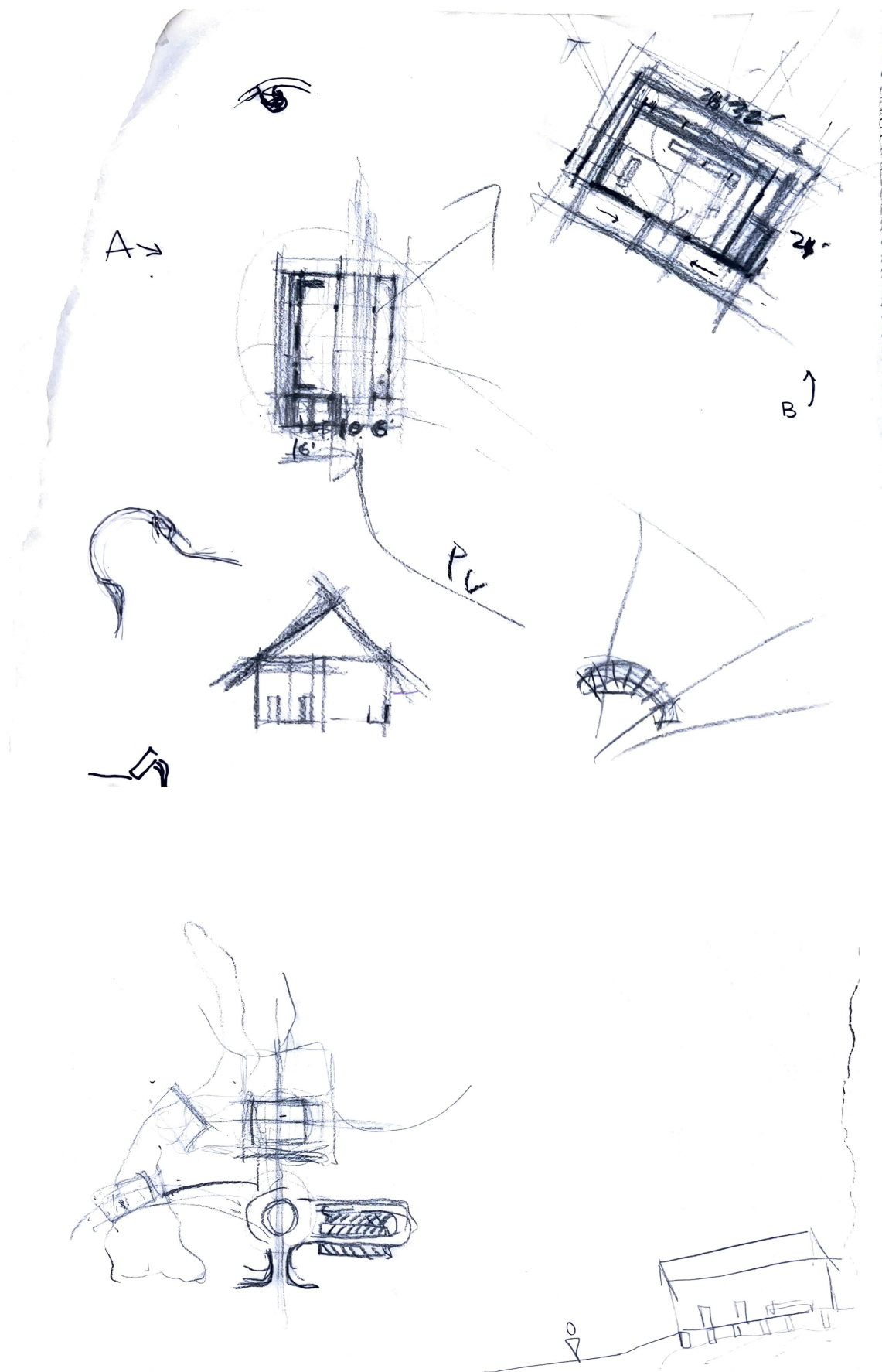
REAL BATHROOMS  
- USE OF TRAILS  
(ENHANCE / DEVE)

→ DIFFERENTIATE  
DIFFERENCES  
BETWEEN PROGRAMMING  
FOR LOW VS.

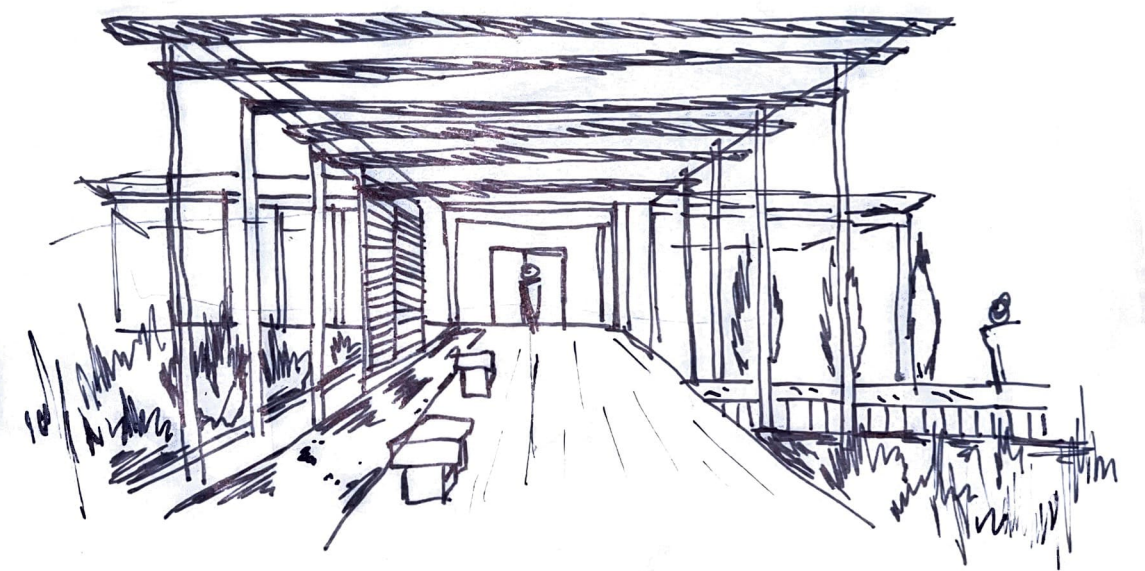
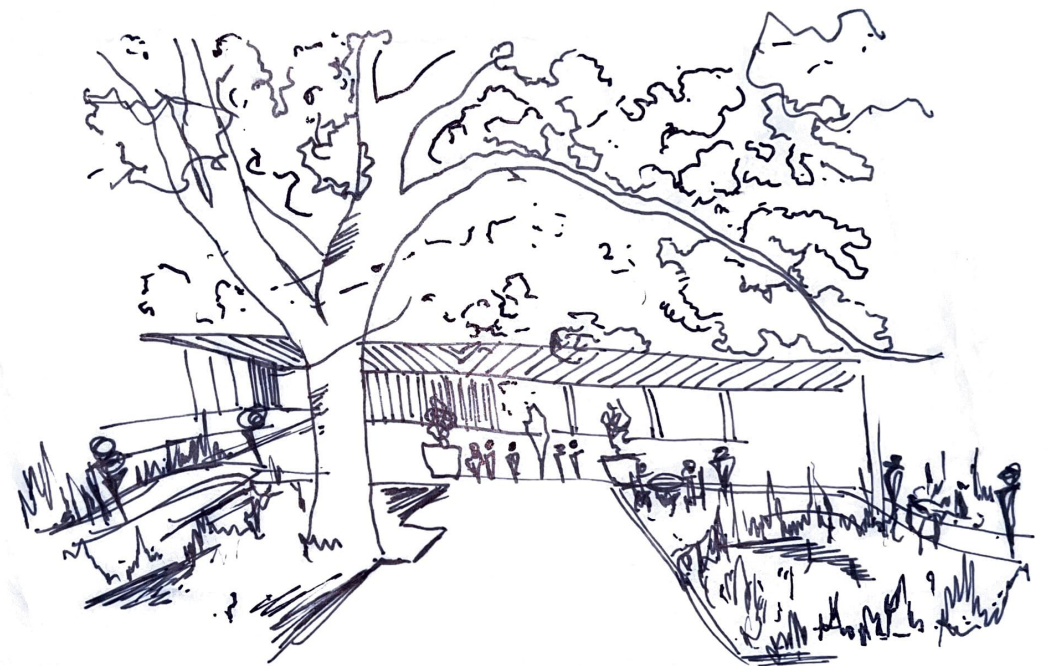
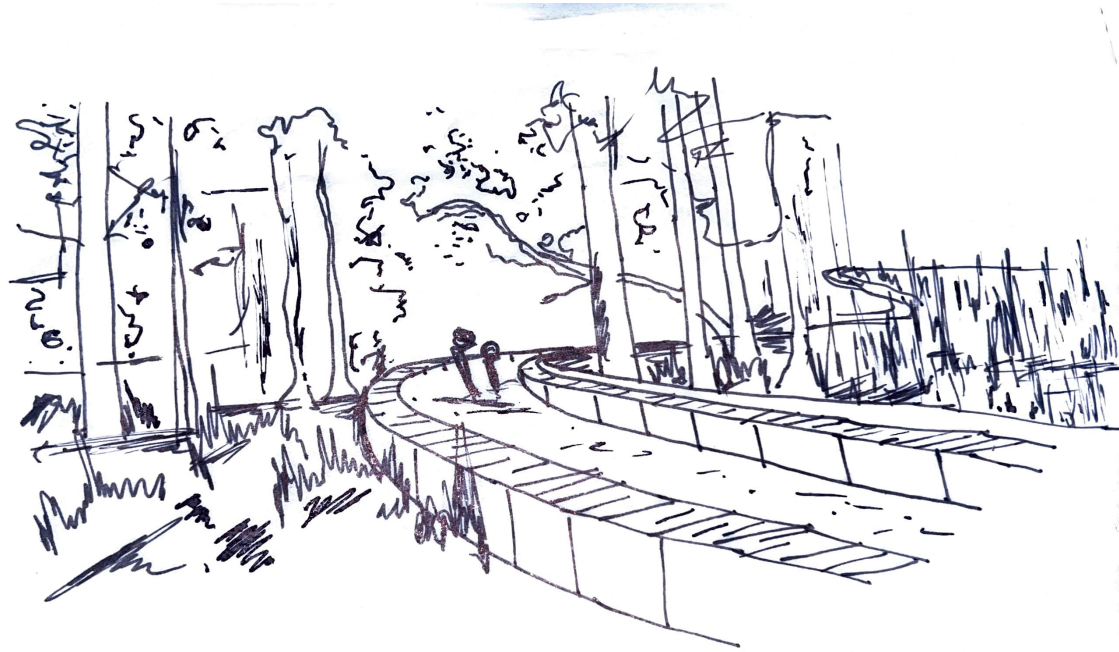
WET-MEADOW  
→ SEPTIC

SEPTIC (BATHROOM  
NO-BATHROOM)  
- SOLAR ACCESS  
- ORIENTATION /  
SW (SHADE) IMPACT







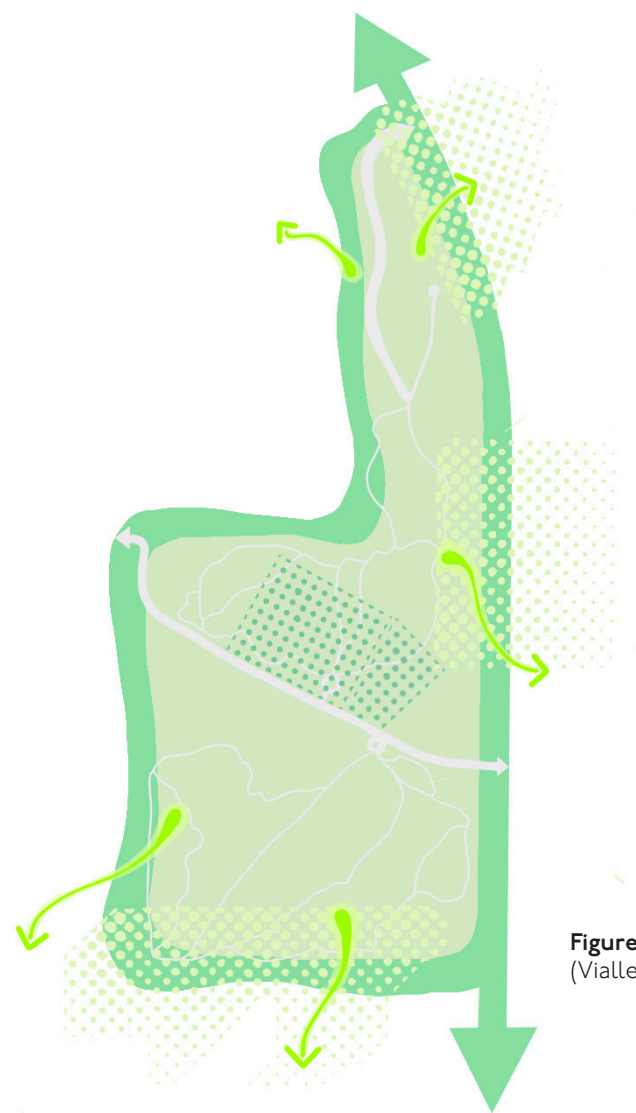




## WASHINGTON MARLATT MEMORIAL PARK MASTER PLAN

### SITE DESIGNS | MASTER PLAN OPTIONS

The premise of this projective design was to create two master plan options that focused on utilizing the most disturbed areas for nature center parking, buildings, and trails. This minimizes the impact on site ecosystems, providing more enhanced ecotourism and a beneficial nature center destination through increased accessibility, improved trail systems, and highlighting views throughout WMMP.



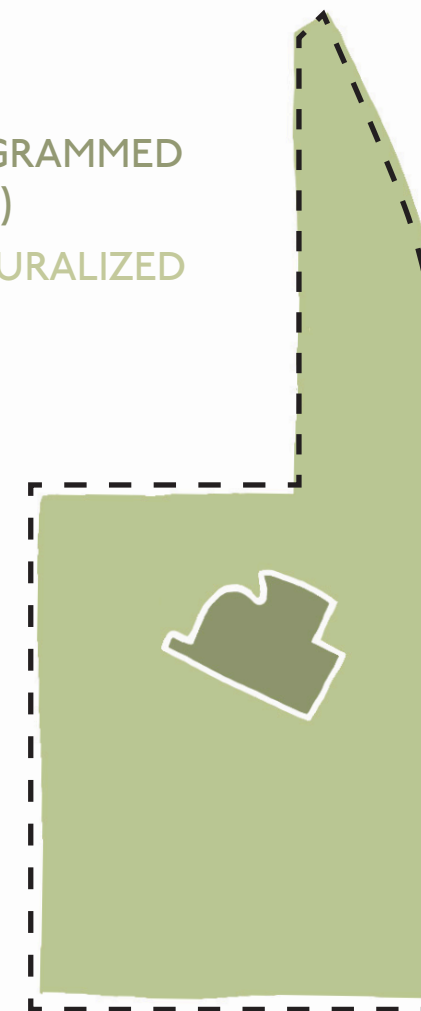
**Figure 4.11** Site Importance  
(Vialle 2023)

### SPATIAL ANALYSIS

The spatial analysis for the master plan was analyzed and modeled to create an effective placement of buildings, new parking areas, trails, and related features. Using disturbed areas for new buildings and expanded parking are a priority. The spatial analysis was completed in the same manner in which the precedent studies were analyzed by looking at the programmed (designed) areas and the naturalized areas. The base organization for both master plan options was to have maximum use of site conditions which includes the conservation and wise use of the vulnerable and suitable areas on-site, which resulted in a range of 12%-15% programmed (designed) spaces, and 85%-88% for open space/naturalized areas.

**12-15% PROGRAMMED  
(DESIGNED)**

**85-88% NATURALIZED  
AREAS**



**Figure 4.12** Site Spatial Analysis  
(Vialle 2023)

## DESIGN COMPONENTS

In response to the background research from Chapter 2, the Methodology from Chapter 3, and the design guidelines, the design components centered around providing an effective nature center destination, providing outreach and areas for engagement of the local community, conservation of natural areas, the productivity of environmental education and ecotourism opportunities, and providing new levels of accessibility. The following are the main features of the established design goals.

### Conservation

- Preservation of the existing tallgrass prairie offers more access and helps highlight WMMP.
- The surrounding context and south side of WMMP provide the community with a natural close-range conservation area to explore.
- The site has a historical aspect of conserving the state of the on-site tallgrass, providing visitors with a successfully conserved tallgrass prairie site.

### Accessibility

- Provide a level of trail accessibility to give all user groups unique and diverse experiences.
- Use the concept of a trail system to provide a main ADA-accessible trail for a full site experience.
- Provide usable and accessible gathering spaces and facilities for the full use of all user groups.
- Have various options for circulation.
- Have multiple opportunities for all user groups.

### Education

- Educational spaces provide areas on-site for effective connections to the tallgrass prairie.
- Surrounding ecosystems provide a unique and diverse hands-on experience for learning and engagement.
- Provide useful and various areas for learning and engagement.
- Educate visitors through signage and close proximity experiences.



Figure 4.13 Design Components (Vialle 2023)



# DESIGN STRATEGIES

The most important strategies used during the projective design and for accomplishing the three design components and enhancing environmental education and site opportunities were the use of a unique trail system that provides a variety of experiences, a nature center with facilities that can enhance community engagement and educational programming, and capturing the beauty of the tallgrass prairie through the use of views with effective vantage points and small structures for lookout points.

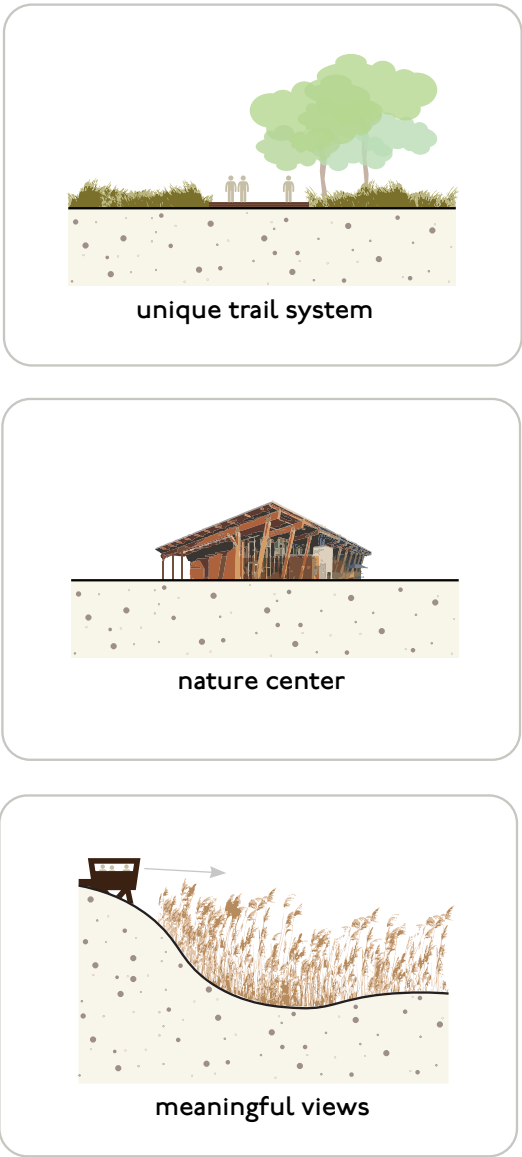


Figure 4.14 Design Strategies (Vialle 2023)

# CONCEPTUAL MASTER PLAN

## OPTION I | LOW-IMPACT DESIGN

The goals of the projective design were to create a unique nature center that provides prairie conservation, improved levels of accessibility, and education opportunities.

Key features within this conceptual plan include the main entrance, visitors center, engagement space, drop-off/loading zone, 24 parking spaces, signage, ADA accessible loop, existing woodland trail, existing mown trail, existing hiking trail, botanical gardens, pollinator gardens, gathering space and lookout points.

LEGEND

1

Main Entrance

2

Visitors Center

3

Engagement Space

4

Drop-off / Loading Zone

5

Parking (24 Spaces)

6

Signage

7

ADA Accessible Loop

8

Existing Woodland Trail | Shaded Walk

9

Existing Mown Trail | Tallgrass Prairie Walk

10

Existing Hiking Trail | Existing Cuesta Experience

11

Botanical Gardens

12

Pollinator Gardens

13

"Top of the Hill" Gathering Space

14

North side Lookout Point

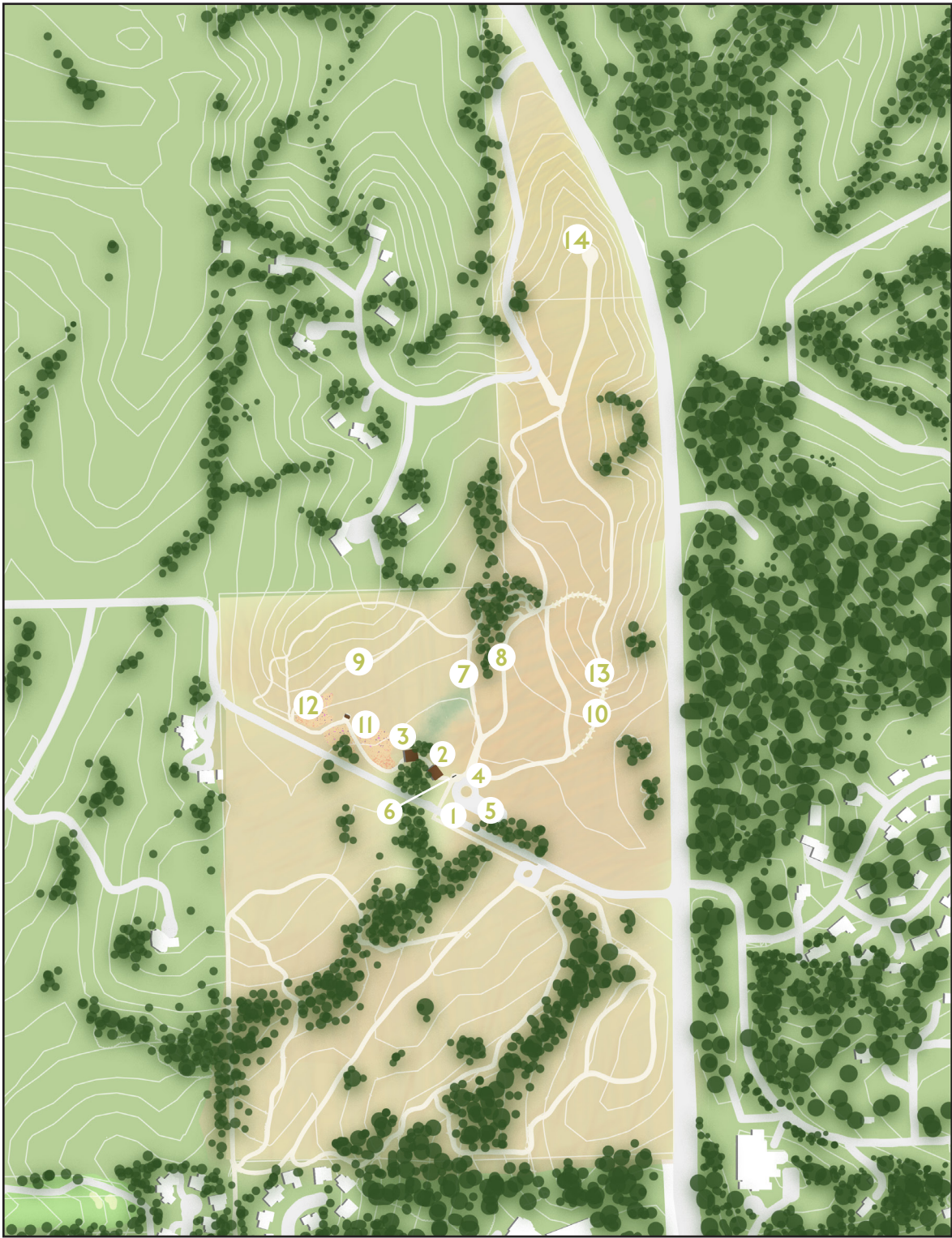


Figure 4.15 Option I Plan (Vialle 2023)



## DESIGN EXPRESSION

### *Nature Center Design*

The first option contains two buildings. The first is the visitors center that contains an easy access from the drop-off and utilizes the existing circulation for a gradual entry. The building contains mixed-use engagement spaces for discussion while also providing pin-up spaces for boards, artwork, maps, and visuals to promote education. The building uses the design strategy of meaningful views and provides a raised lookout deck for observation and visual connections to the site. The second building is also connected to the existing circulation and contains desks and chairs to allow user groups, such as children and teachers to use the space for learning and active engagement.

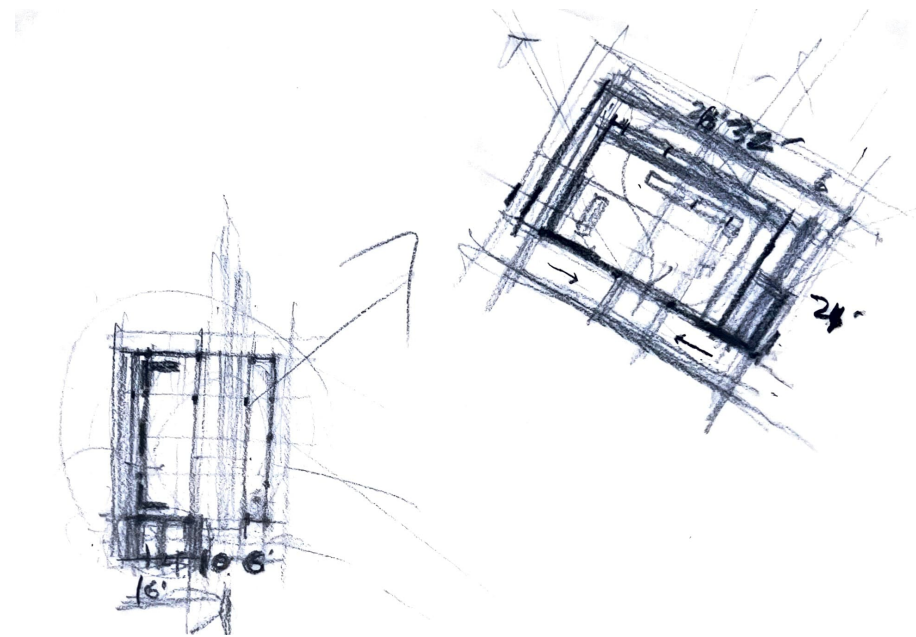




Figure 4.16 Option I Aerial Axon (Vialle 2023)



## OPTION 2

Key features within this conceptual plan include the main entrance, visitors center, nature center corridor, nature engagement space, drop-off/loading zone, 24 parking spaces, signage, ADA accessible loop, woodland trail boardwalk, wet meadow trail boardwalk, mown trail, hiking trail, gathering space, north access road, lookout points, botanical gardens, pollinator gardens, wet meadow/wet prairie, outdoor gathering space, and the woodland picnic shelter.

### LEGEND

- |                                           |                             |
|-------------------------------------------|-----------------------------|
| 1 Main Entrance                           | 16 Botanical Gardens        |
| 2 Visitors Center                         | 17 Pollinator Gardens       |
| 3 Nature Center Corridor                  | 18 Wet Meadow / Wet Prairie |
| 4 Nature Engagement Space                 | 19 Outdoor Gathering Space  |
| 5 Drop-off / Loading Zone                 | 20 Woodland Picnic Shelter  |
| 6 Parking (24 Spaces)                     |                             |
| 7 Signage                                 |                             |
| 8 ADA Accessible Loop                     |                             |
| 9 Woodland Trail   Boardwalk              |                             |
| 10 Wet Meadow Trail   Boardwalk           |                             |
| 11 Mown Trail   Tallgrass Prairie Walk    |                             |
| 12 Hiking Trail   Cuesta Experience Trail |                             |
| 13 "Top of the Hill" Gathering Space      |                             |
| 14 North Access Road                      |                             |
| 15 North side Lookout Point               |                             |



Figure 4.17 Option 2 Plan (Vialle 2023)

## DESIGN EXPRESSION

### Nature Center

The second option contains three buildings. The first is the visitors center that contains an easy and large open access from the drop-off and utilizes the existing circulation for a gradual entry. The building contains mixed-use engagement spaces for discussion while also providing pin-up spaces for boards, artwork, maps, and visuals to promote education and gathering. The building is fully ADA accessible with ramps surrounding the whole facade and includes an open green space for gathering and leisure activity. The second building is the nature center corridor, which will hold artwork, educational signage, and other interactive elements to help educate visitors on the importance of the tallgrass prairie. This corridor serves as a connection to the third building which is the nature engagement space. This building is a mixed-use space that can accommodate user groups such as children and teachers to utilize for education. All three buildings use the design strategy of meaningful views that are enhanced through raised lookout decks for observation and visual connections to the site, direct links to the trail systems and unique architecture great for viewing the site, all of which is to be constructed with sustainable materials.

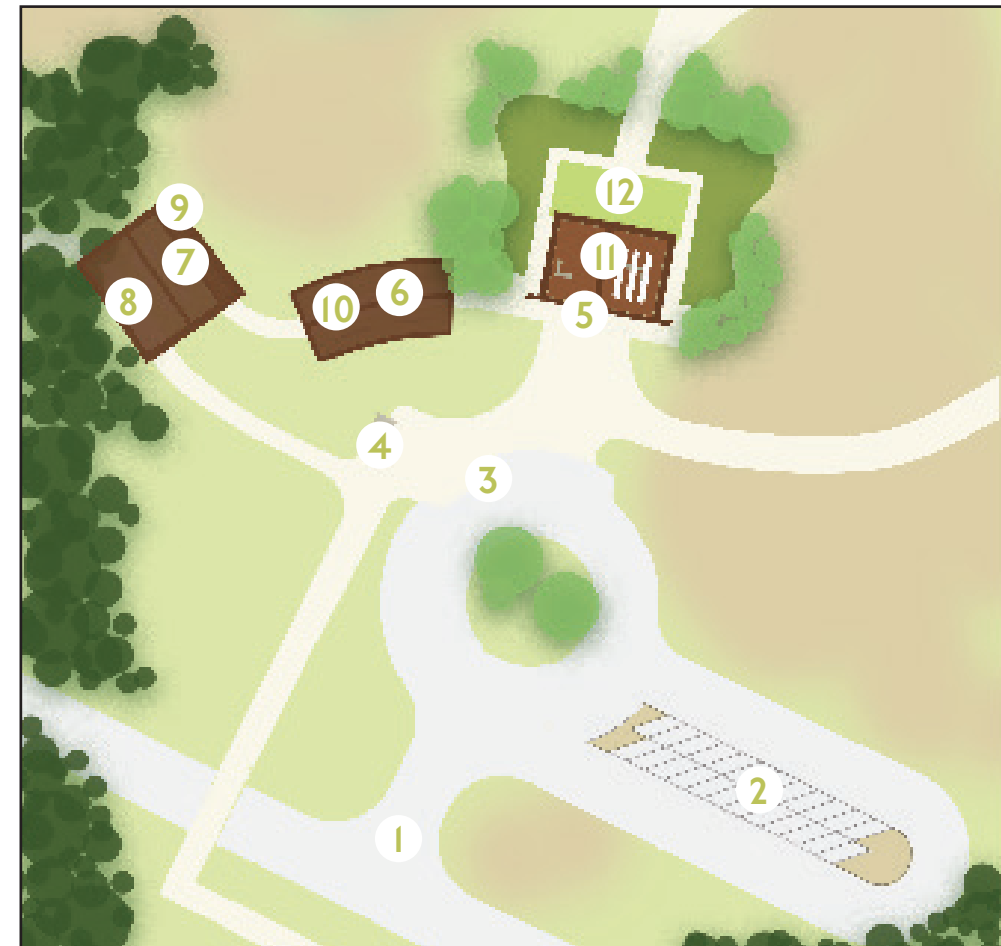


Figure 4.18 Option 2 Nature Center Plan (Vialle 2023)

### LEGEND

- |                           |                                       |
|---------------------------|---------------------------------------|
| 1 Entrance                | 7 Nature Engagement Space             |
| 2 Parking (24 spaces)     | 8 Children's Mixed-use Learning Space |
| 3 Drop-off / Loading Zone | 9 Observation Deck                    |
| 4 Signage                 | 10 Educational Signage                |
| 5 Visitors Center         | 11 Visitor Gathering Space            |
| 6 Nature Center Corridor  | 12 Green Space Courtyard              |



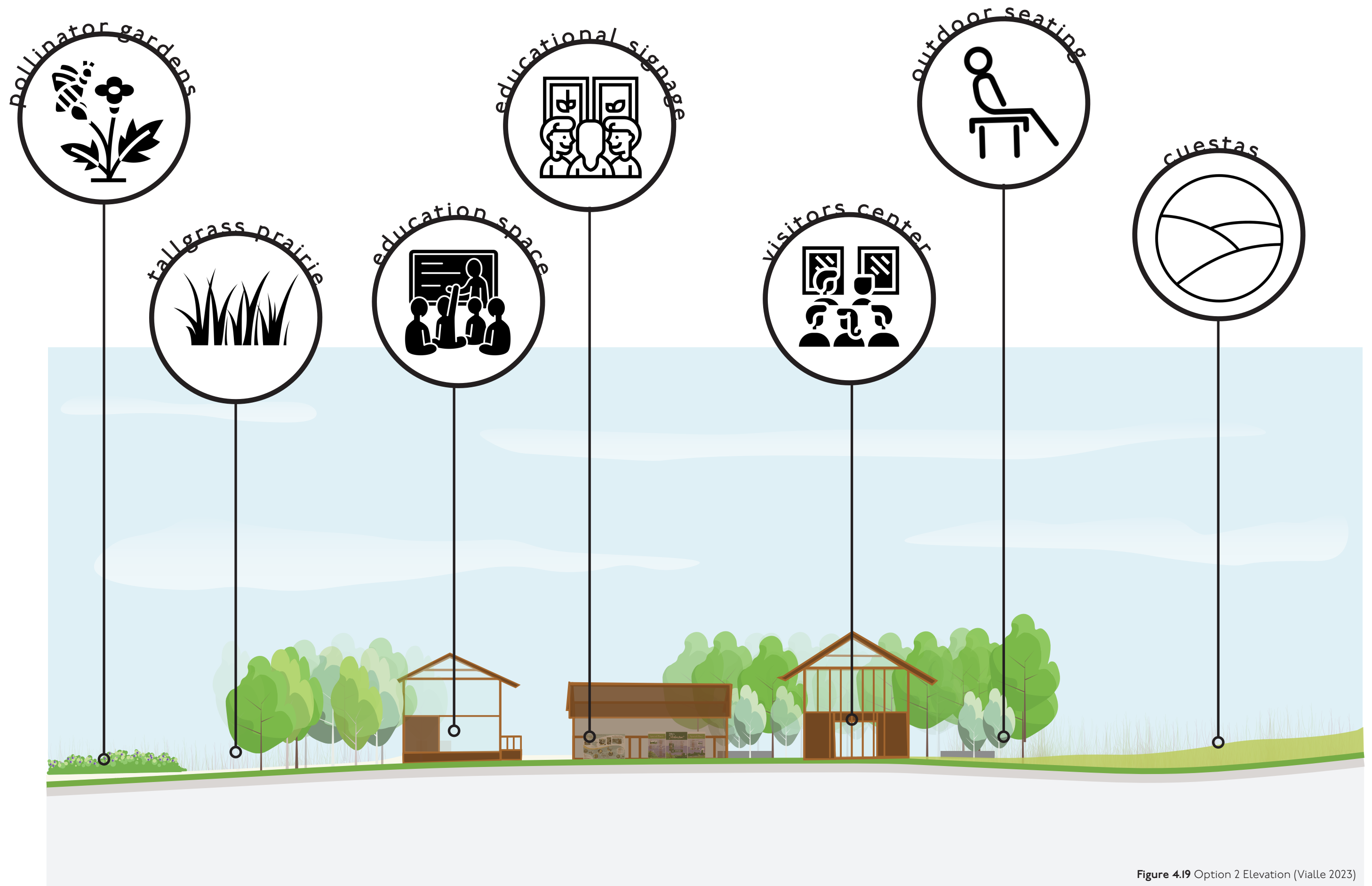


Figure 4.19 Option 2 Elevation (Vialle 2023)

## TRAIL SYSTEM AND PROGRAMMING

### ***Woodland Trail | Boardwalk***

The woodland trail provides a full ADA accessible loop which includes a boardwalk that hugs the east side of the existing wooded area on the north side of the site and also connects to the woodland picnic shelter.

### ***Wet Meadow Trail | Boardwalk***

The wet meadow trail is a boardwalk trail that hugs the edge of the retention zone of the wet prairie. It included signage and allows users to connect with a variety of plant species.

### ***Mown Tallgrass Trail***

The mown trail allows users to wander amongst the tallgrass and get close to the variety of plant species. Programming includes educational signage and rest spots for seating.

### ***Hiking Trail | Cuesta Experience Trail***

The hiking trail is the more adventurous trail giving users a chance to experience the slopes and cuerdas on the site. The trail offers lookout points and stepping inclines for a more active and engaging experience.





Figure 4.20 Option 2 Aerial Axon (Vialle 2023)



Figure 5.0: Konza Buffalo (Hammel 2020)

# Conclusion

## contents

- report summary
- project significance
- project limitations
- project recommendations
- project limitations
- future research
- final thoughts



# 5 CONCLUSION

Many people don't fully appreciate the significance of the Flint Hills Ecoregion and the beauty of the tallgrass prairie. Nature-based exploration, environmental education, and ecotourism have been impacted in many areas like The Flint Hills Ecoregion due to the lack of knowledge or understanding of how to enhance the human-nature connection. To end this report, the project significance and the importance of this topics led the selected site of WMMP to have a direct connection to the Flint Hills Ecoregion. The outcome of this project will become a starting point for any potential design moves for the site and can hopefully serve as a basis for redesigning WMMP.

## REPORT SUMMARY

The aim of this report was to look into the dilemma of the lack of knowledge on ecotourism and environmental education, and to educate on the opportunities and impacts it has along with bringing a new nature center to a culturally and historically significant public park.

This report attempted to answer the research question: How can the Flint Hills Ecoregion be responsibly used as a community resource for human-nature connections to the tallgrass prairie, and use ecological design strategies to enhance and increase educational opportunities for the existing naturalized site at Washington Marlatt Memorial Park?

## PROJECT SIGNIFICANCE

In recent years, with a pandemic and the rise in screen time, there has been a large disconnect with the human-nature connection. People are not spending as much time outside and don't have strong relationships with their surrounding environment. With the pandemic causing many people to travel and explore less people would often go on adventurous trips to natural areas. As travel has regained momentum, people have started to take trips to see the unique environments such as the beautiful Flint Hills and explore for successful environmental education. Landscape architecture is a profession that values the importance of good, usable outdoor public space. This value of the environment help to bring environmental education as well as other primary factors

such as design, sustainability, conservation, education and accessibility. As a landscape architect, it is vital to work towards designing to enhance user experience and promote the human-nature connection. By choosing a location with Ecoregional significance and community connections, WMMP served as an effective space to enhance the natural environment, promote education, and improved accessibility. This project was an effective way to bring more environmental education opportunities to the Flint Hills and overall shed light on ecotourism within landscape architecture.

## PROJECT LIMITATIONS

This report focused on environmental education, ecotourism, and enhancing conservation, accessibility, and providing a nature education center for educational programming. However, with the expansiveness of environmental education, having more research into other Ecoregions could benefit design moves and programming.

Interviews were another limitation due to time and availability, but would have benefited the knowledge on community engagement and the needs of different user groups.

## PROJECT RECOMMENDATIONS

Tourism has grown to become a large industry with several opportunities that center around environmental education. Ecotourism is a complex and constantly changing environment in which it is hard to design something ideal for all user groups. With the scope of the project and the time that was allotted, it made it slightly difficult to fully be able to consider every possible option for the benefit of the design and site itself. A few recommendations to help further this project were to strive for more community engagement and outreach. To get in touch with community groups, other professionals and ecotourists themselves. To communicate possible ideas and learn about restrictions it would be beneficial to take this project and the opportunities of the selected site to the next level through furthering the projective design.

## FUTURE RESEARCH

Future research for this project could include creating a typology related to specific conservation and preservation techniques for the established tallgrass prairie on-site. As established in this report there is a need for expanding environmental education opportunities and being able to provide a useful educational destination throughout communities. Additional research could include looking deeper into how to engage the community in the development of nature center education programming and expanding the use of the tallgrass prairie.

With ecotourism being a newer type of tourism and the recent growth of it, the future research could also include a comparative analysis between different areas and/or Ecoregions around the world. By researching various locations, it would allow for the maximum amount of programming, ecotourism and environmental education opportunities that could apply to the Flint Hills Ecoregion. Looking at different countries could benefit and show how tourism and tourism types are different within other locations and cultures.

Other research could include community outreach events to gauge what specifically the community is desiring for their community. This would give guidelines to what the community feels it is lacking in regards to outdoor programming and opportunities along with any negatives or concerns that the

## FINAL THOUGHTS

The project identified a lack of understanding on what ecotourism is, environmental education, and how it can benefit a historical and beautiful nature-based community. It helped to explore options for implementing nature centers for educational programming along with improvement of accessibility and trail system diversity. The goal was to bring environmental education through establishing a nature center for educational programming and enhanced outdoor opportunities all to help build the strength of the human-nature connection in this one park. The projective design involved two low-impact conceptual design to allow for varying levels of design impact. This projective design included design considerations and factors that guided the site to be brought towards a more environmental education site all while embodying the beauty of the Flint Hills Ecoregion, the tallgrass prairie diversity, and the value of a nature center.

*“...but the hardest things to start, are always the most worthy.”*

**– Author**





**Figure 6.0** Konza Windmill (Redd 2029)

# Appendices

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- appendix a: references
- appendix b: figure references
- appendix c: international ecotourism
- appendix d: agritourism

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# APPENDIX C:

## INTERNATIONAL ECOTOURISM

### GOALS OF THE INTERNATIONAL ECOTOURISM SOCIETY

The International Ecotourism Society (TIES) is a nonprofit organization, founded in 1990 that is focused on providing and promoting resources for quality ecotourism. TIES has led the movement for the connective network that is sustainable place-based and eco-sensitive tourism and in turn the increase of ecotourism, abiding by guidelines, and enhancing the professional network of traveling to conserve local landscapes and those living with these special places.. With outreach and established principles of ecotourism, its members are dedicated to helping communities and other organizations promote tourism and ecotourism practices. It is at the forefront of ecotourism and conservation travel techniques, providing all with tools to implement conservation based travel (TIES n.d.).

### NEGATIVE EFFECTS

Ecotourism was developed and furthered in the hopes that it would benefit local people and reduce negative impacts it may have on the environment and areas that humans interact with. As ecotourism has grown, practices have sometimes failed to support sustainability and related socio-ecological issues.

Ecotourism activities were designed to educate, entertain and reduce destruction to the environments tourists interact with. As climate change and negative effects from degradation of ecosystems arise, tourism should work to create positive impacts. It is vital to recognize areas that are vulnerable, and/or in danger and set guidelines to bring attention to the public eye. Weaver discusses how management and environmental practices can be used in beneficial ways. Programming and design standards can be integrated to mitigate these issues and reduce effects from climate change and poor human interaction (Weaver 2001).

### SOCIO-CULTURAL OPPORTUNITIES

The ecotourism community and culture have been influenced to help strengthen the overall tourism industry and experience that come from it. Ecotourism influences communities, peoples, traveling ability, both positively and negatively and affects the understanding of what it means to visit a non-local community. Weaver discusses how “local labor and expertise” provide knowledge and insight into other cultures and their surrounding environments (Weaver 2001). People share common identities in addition to the desire to travel or participate and tourism. Local experts and residents with a connection to the land and those who live there value the surrounding landscapes and history, and can help to build understanding, appreciation for, and appropriate ecotourism programming and design with an environmental and social context in mind (Choi et al 2006).

# APPENDIX D: AGRITOURISM

## AGRITOURISM

Agritourism is a farm-based, ever growing tourism form that has business programming centered around on providing activities, recreational entertainment, and food significance to that regional area or environment. With it being a food producing in entertainment based industry it has goals related to agricultural development, tourism development, and enhancement of quality of life of farm and agricultural communities.

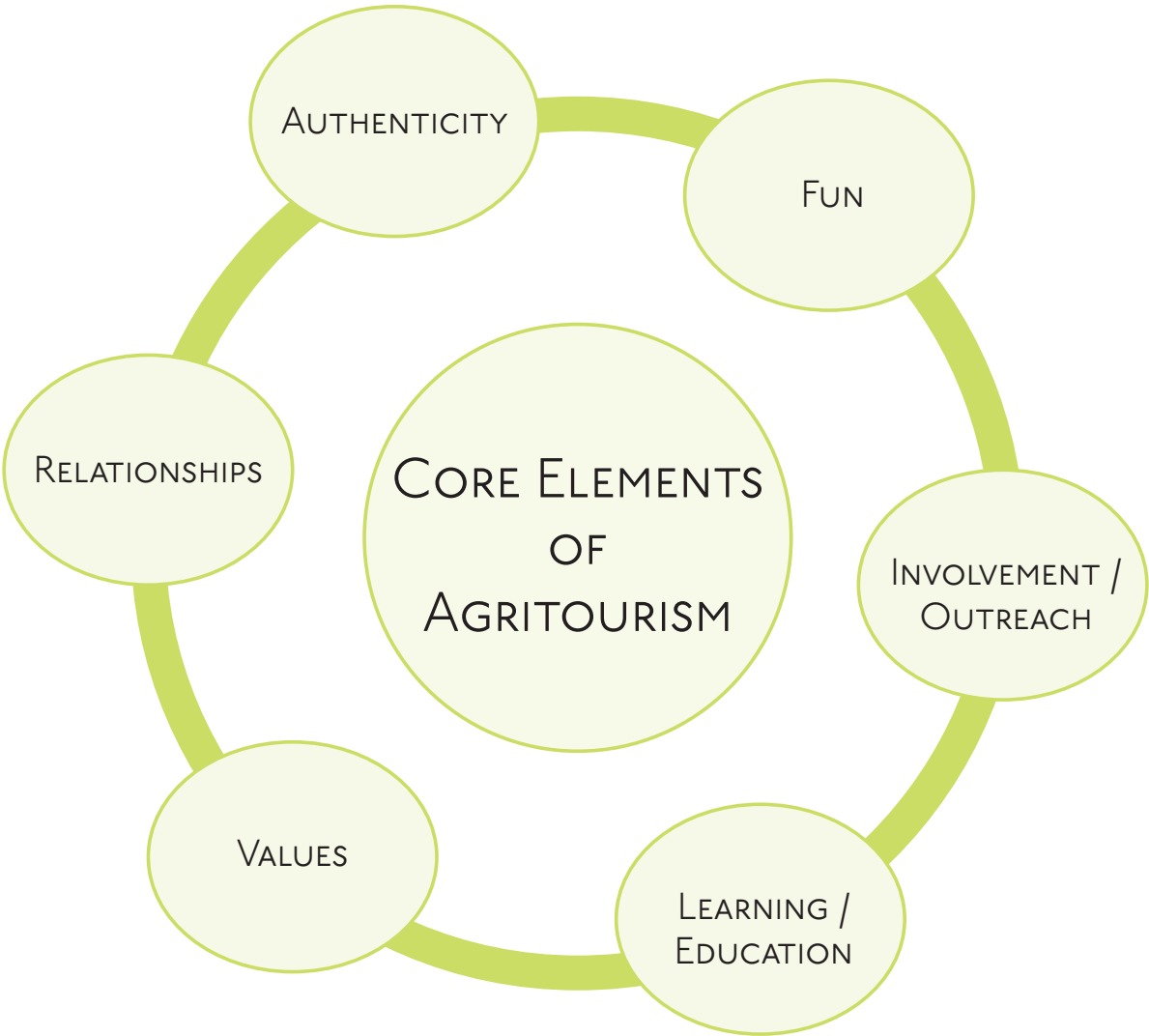
Agritourism can be defined as:

*“a form of commercial enterprise that links agricultural production and/or processing with tourism to attract visitors onto a farm, ranch, or other agricultural business for the purposes of entertaining and/or educating the visitors while generating income for the farm, ranch, or business owner. (Agritourism Overview, 2022).”*

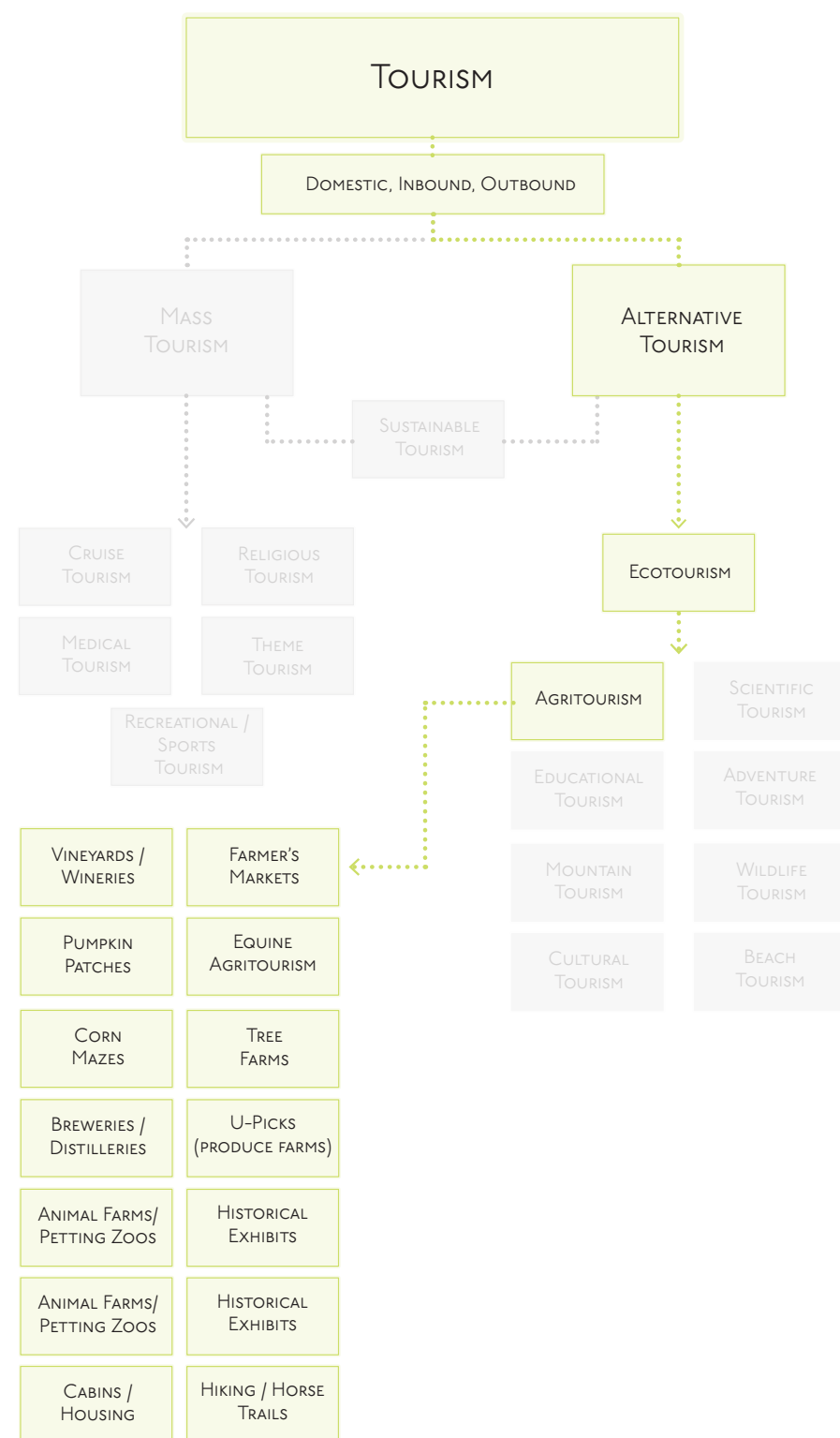
Agritourism is recognized in literature, and it’s been developed through characteristics of agricultural benefits and farm-based classifications, various activities, and visitor experiences. There are certain criteria that fall under advertising which leads to five classification typologies to watch it was developed. (Tew et al 2012).

These criteria include:

- 1. *Non-working farm, agritourism (i.e. bed and breakfast on a former farm)*
- 2. *Working farm, passive contact, agritourism (i.e. bed & breakfast on current farm)*
- 3. *Working farm, indirect contact agritourism (i.e. serving products and meals on the farm)*
- 4. *Working farm, direct contact (authentic agritourism such as helping with farming demonstrations)*







## TYPES OF AGRITOURISM PROGRAMMING

### *Vineyards & Wineries*

One of the most popular types of agritourism businesses and farms include wineries. They produce grapes, harvest, clean and process the grapes and may also produce vegetables as well as other produce related to the production of wine. Wineries commonly also provide on farm entertainment, as well as wine, tastings, trails, music, and other event accommodations and/or amenities (Transforming the Way the World Travels 2022).

### *Farmer's Market*

Agritourism involves farmer's markets are common ways for people and other communities to get produce through the farm property. Common markets tactics include stands, booths, stores and outdoor displays (Transforming the Way the World Travels 2022).

### *U-Picks*

Agritourism includes U-picks which are farms that give customers opportunities to pick products such as vegetables, fruit, pumpkins, flowers, and trees. U-picks are farms that give customers opportunities to pick products such as vegetables, fruit, pumpkins, flowers, and trees (Transforming the Way the World Travels 2022).

### *Pumpkin Patches*

Pumpkin patches are a form of tourism when they grow and sell pumpkins in ways that invite visitors to learn about the farming heritage of the region. On farm pumpkin patches are often considered U-picks, but also farmer's markets (Transforming the Way the World Travels 2022).

### *Equine Agritourism*

This type of agritourism provides opportunities for visitors to interact with horses. These farms/ranches commonly include: riding, trails, lessons, ranches, camps, and other equine-related

amenities. This type of agritourism provides opportunities for visitors to interact with horses. Includes riding trails lessons, ranch camps, and other equine related amenities (Transforming the Way the World Travels 2022).

### **Corn Mazes**

Corn mazes are cut out of cornfields to provide entertainment for visitors and provide excitement (Transforming the Way the World Travels 2022).

### **Tree Farms**

Pumpkin patches are a form of tourism when they grow and sell pumpkins in ways that invite visitors to learn about the farming heritage of the region. On farm pumpkin patches are often considered U-picks, but also farmer's markets (Transforming the Way the World Travels 2022).

### **Breweries & Distilleries**

Breweries and distilleries are included in agritourism opportunities through produce growth, brewing processes and distilling processes (Transforming the Way the World Travels 2022).

### **Animal Farms & Petting Zoos**

Petting zoos are a good way to attract visitors and have them get involved with raising animals and interacting with them. It attracts families and children due to it being entertaining and educational (An Introduction to Agritourism 2022).

### **Historical / Educational Exhibits**

History and educational amenities are involved with many of the identified forms of agritourism and they provide knowledge and an understanding of the types of activities and tourism dynamics to the public eye (An Introduction to Agritourism 2022).

### **Cabins & Housing (Lodging)**

Farms and other forms of tourism may include housing and living accommodations. Agritourism often provides opportunities for overnight stay and involvement with farm management and local attractions (An Introduction to Agritourism 2022).

### **Hiking Trails**

Agritourism involves levels of hiking, trails and physical activity. Providing good methods of outdoor activities such as food and nature experiences, horse trails also could be included impact the use of foot trails and move sites to spatial expansion (Transforming the Way the World Travels 2022).



