

Experiential Design for Elephant Conservation

by

Kelsie Danielle Shy

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

2017

Approved by:

Major Professor
Jessica Canfield

Abstract

In the past few decades, U.S. cities have seen a rise in animal sanctuaries as an alternative for traditional zoos. These facilities are often seen as more humane because they provide more space and natural surroundings than zoos do. The impact of animal activists and increasing regulations are forcing many zoos to close exhibits for their largest, most expensive animal: the elephant. When these elephant exhibits are closed, the elephants cannot return to the wild. They must be sent to either another zoo, or an elephant sanctuary. As more and more elephants are being retired from zoos, the few sanctuaries in the United States must take on the responsibility of housing them. Elephants are an endangered species, and experience a major threat from poaching and harmful tourism practices. Elephant tourism is one of the most popular industries in southeast Asia, and has led to the use of cruel training techniques. Most people, even those with interest in animals, are unaware of these threats. There are many animal sanctuaries all over the world that use tourism as a way to educate the public and about conservation and raise funds. However, there are few places like this in the United States. Creating a place for elephant based tourism in the U.S. may solve the issue of limited sanctuary space, while providing an opportunity for visitors to learn about elephants and the need for conservation. The landscape architecture profession has an opportunity to contribute to animal sanctuaries because of its knowledge in design, art, science, and the relationship between the built and natural environment. Thoughtful design and functionality is beneficial for a harmonious relationship between visitors, caretakers, and animals.

This project proposed a design for an expanded sanctuary at the Ringling Center for Elephant Conservation in Polk City, Florida. This center is currently home to the Ringling Circus' retired performing elephants. The purpose of this project is to examine how the design of a conservation center can influence visitor experience and promote public conservation efforts for endangered animal populations, specifically the Asian elephant. By studying existing animal attractions, conservation efforts, elephant care resources, and visitor education guidelines, a collective knowledge can be applied to a new conservation center. Methods to support this projected design include: precedent studies, analysis of zoo exhibit design guidelines, financial analysis, and site inventory and analysis. The results of this research give direction to the final design outcome.

This project concludes with a new conservation center design that creates unique, interactive experiences between visitors and elephants, while connecting the elephants to an overall message of conservation. A variety of activities cater to all types of visitors and offer fulfilling encounters while adventuring on the site. A multifunctional design that utilizes sinuating circulation, vista-like views, cultural materiality, animal enrichment features, and creative safety techniques allows guests to have a visceral experience and ignites an emotional connection towards the elephants, which in turn leads to care for conservation.



EXPERIENTIAL DESIGN

FOR ELEPHANT CONSERVATION

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Kelsie Shy

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Masters Report submitted in partial fulfillment of the requirements for the degree of

Master of Landscape Architecture (MLA)

Major Professor: Jessica Canfield

Supervisory Committee: Howard Hahn and Jeffrey Skibins

Kansas State University

College of Architecture, Planning, and Design

ABSTRACT

In the past few decades, U.S. cities have seen a rise in animal sanctuaries as an alternative for traditional zoos. These facilities are often seen as more humane because they provide more space and natural surroundings than zoos do. The impact of animal activists and increasing regulations are forcing many zoos to close exhibits for their largest, most expensive animal: the elephant. When these elephant exhibits are closed, the elephants cannot return to the wild. They must be sent to either another zoo, or an elephant sanctuary. As more and more elephants are being retired from zoos, the few sanctuaries in the United States must take on the responsibility of housing them. Elephants are an endangered species, and experience a major threat from poaching and harmful tourism practices. Elephant tourism is one of the most popular industries in southeast Asia, and has led to the use of cruel training techniques. Most people, even those with interest in animals, are unaware of these threats. There are many animal sanctuaries all over the world that use tourism as a way to educate the public and about conservation and raise funds. However, there are few places like this in the United States. Creating a place for elephant based tourism in the U.S. may solve the issue of limited sanctuary space, while providing an opportunity for visitors to learn about elephants and the need for conservation. The landscape architecture profession has an opportunity to contribute to animal sanctuaries because of its knowledge in design, art, science, and the relationship between the built and natural environment. Thoughtful design and functionality is beneficial for a harmonious relationship between visitors, caretakers, and animals.

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CHAPTER 1

INTRODUCTION



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Research Question: How can informed habitat design contribute to conservation efforts and provide opportunities for interaction between animals and visitors in an elephant sanctuary?

In the past few decades, U.S. cities have seen a rise in animal sanctuaries as an alternative for traditional zoos. These facilities are often seen as more humane because they provide more space and natural surroundings than zoos do. Wildlife parks, an imitation safari that allows visitors to see animals in simulated native habitats, have also grown in popularity, showing that tourists are becoming more interested in seeing natural habitats and safari like experiences than artificial zoo habitats. Meanwhile, the impact of animal activists and increasing regulations are forcing many zoos to close exhibits for their largest, most expensive animal: the elephant. When these elephant exhibits are closed, the elephants cannot return to the wild. They must be sent to either another zoo, or an elephant sanctuary. Performance animal handlers are undergoing even more criticism than zoos due to tight living quarters and forced performances. As more and more elephants are being retired from zoos and stage performances, the few sanctuaries in the United States must take on the responsibility of housing them. Elephants are the largest animal on land, and therefore caring for them places a large financial burden on sanctuaries.

Elephants are an endangered species, and experience a major threat from poaching, land encroachment and harmful tourism practices, mainly in Africa and Asia. There is very little of what people think of “the wild” left. Humans have encroached upon much of the elephant’s native land, and almost all “wild” elephants live on controlled preservation areas. Elephant tourism is one of the most popular industries in southeast Asia, and has led to the use of cruel training techniques. Most people, even those with interest in animals, are unaware of these threats. The solution is education and research. There are many animal sanctuaries all over the world that use tourism as a way to educate the public and about conservation and raise funds. However, there are few places like this in the United States. Creating a place for elephant based tourism in the U.S. may solve the issue of limited sanctuary space, while providing an opportunity for visitors to learn about elephants and the need for conservation. Direct connection is very influential among visitors, because not everyone can visit animals in their natural habitats. A trip to a sanctuary may be the closest many people get to seeing an elephant in its natural surroundings.

The Ringling Brothers and Barnum & Bailey Center for Elephant Conservation in central Florida is a sanctuary dedicated to the conservation, breeding, and understanding of elephants. Since 1995, this working farm has been home to retired Ringling Circus elephant performers, as well as some elephants who were not well suited for the stage. In recent years the Ringling Brothers have undergone extreme criticism for their use of performing animals in shows. Protesters and new city regulations have caused the company to end its elephant shows. In March 2015, the Ringling Circus announced the retirement of their remaining thirteen performing circus elephants, and by May 2016, the elephants were moved

to the Ringling Center for Elephant Conservation (CEC) in central Florida (Ager, 2015). Previous to this announcement, the Center housed thirty elephants. This 200-acre conservation center is now home to the largest herd of Asian elephants in North America (Ager, 2015).

Now that the elephants have been relocated to live at the center, Ringling is still under criticism about controversial issues such as adequate space, natural behavior, breeding, and research. Ringling CEO Kenneth Feld told National Geographic that he aims to someday show tourists the grandeur of the Asian elephant, if not at the current center then someplace nearby. The conservation center is a twenty-minute drive from Disneyworld. Feld believes that if it were to be opened to the public, Orlando’s already thriving tourism would spill into the CEC (Ager, 2015). Although the owners and staff have vocalized their wish to be able to show people their elephants, the CEC facility has yet to be designed to adequately accommodate tourists.

This report capitalizes on this opportunity and proposes an imagined site design for the Ringling Brothers Center for Elephant Conservation. The existing facility will be expanded and retrofitted to accommodate visitors. The goal of the proposed design is to harmoniously intertwine the separate needs of tourists, elephants, and caretakers. It is projected that by adding a tourism component to the CEC many benefits may arise, such as conservation awareness to educate the public about the endangerment of elephants and public understanding to balance the negative association with animals in captivity. The income from these visitors could alleviate costs of the CEC in order to ensure future care for the animals, as well as donations to conservation efforts. Some zoos contain exhibits that people can pass by without noticing or learning about the animals. A thrilling design that promotes as much interaction as possible, with minimal disruption to natural elephant behavior, will provide tourists with a unique and memorable experience.

Landscape architects already play a role in zoo design, and are therefore able to contribute to the design of conservation centers and sanctuaries too. The final imagined design in this report is the first of its kind in the United States. This report studies how informed habitat design can contribute to conservation efforts and provide opportunities for interaction between animals and visitors in an elephant sanctuary. Several research methods are explored to address this question. The results of this research give evidence to a new imagined CEC facility, which provides examples of how research conclusions can be applied to sanctuary design. Methods to support this projected design include: precedent studies, analysis of zoo exhibit design guidelines, financial analysis, and site inventory and analysis. After analyzing site suitability for the existing location of the center, precedent studies and interviews are conducted to support design decisions. An elephant-specific derivative of Ploutz’s “New Cognitive Based Zoo Design Guidelines” (Ploutz 2012) gives further evidence for the final site plan for the CEC. The final method and initial step in site design is to perform a site analysis on the location of the new Center for Elephant Conservation. Research conclusions on topics surrounding the CEC’s mission lead to informed design solutions for the new facility

CHAPTER 2

BACKGROUND



Figure 2.1: Jaguar Rescue Center Tree

This chapter summarizes the background knowledge needed to be able to design a new Ringling Center for Elephant Conservation. The following condenses a collection of resources pertaining to topics surrounding the project. Resources used include books, videos, articles, websites, and one on one conversations with experts. Topics researched include: elephant endangerment, animal activism, zoological park history, animal conservation, exhibit design, elephant care, operation costs, visitor education, and Ringling. Knowledge of these topics are necessary to make informed, conscious decisions about additional research methods used in this report and the final center design.

TERMINOLOGY

There are words in this review that may be used interchangeably, however many have specific references. The term habitat is used to define the environment within an animal’s enclosure. The term exhibit is used in relation to the space where the public interacts with a habitat. A zoo, or zoological park, is what most people think of when they hear the word: It is a park that contains many different species of wild animals for study and display to the public. A sanctuary private ranch is a place where elephants live with assistance from people who provide food, water, care, and shelter but are not required to meet the requirements of accreditation organizations (AZA, 2017).

While the CEC site used in this report defines itself an elephant conservation center, many of its purposes overlap with what the AZA defines as a sanctuary. Sanctuaries merely provide a home, whereas the CEC also has a breeding program and research initiatives (AZA, 2017; Ringling CEC, 2017). In this report, the word “sanctuary” is used to describe a facility with at least 50 acres that houses elephants and promotes conservation efforts. In order to explore the variances in different large elephant facilities, the missions of both sanctuaries and centers are reviewed.

EXISTING ELEPHANT SANCTUARIES

The United States currently has only six sanctuary facilities dedicated primarily to elephants. None of these facilities are run by zoos, however many collaborate with zoos in the same region. There are many more sanctuaries located in Africa and Asia. However, since this report focuses on elephant conservation in the U.S., only U.S. facilities will be studied in depth. The six U.S. elephant sanctuaries are listed with their locations and mission statements.

The Elephant Sanctuary in Tennessee (Hohenwald, Tennessee):

“Provide captive elephants with individualized care, the companionship of a herd, and the opportunity to live out their lives in a safe haven dedicated to their well-being; Raise public awareness of the complex needs of elephants in captivity, and the crisis facing elephants in the wild.” (“The Elephant Sanctuary: Hohenwald Tennessee,” 2014)

Performing Animal Welfare Society (PAWS) Sanctuary (San Andreas and Galt, California):

“PAWS is dedicated to the protection of performing animals, to providing sanctuary to abused, abandoned and retired captive wildlife, to enforcing the best standards of care for all captive wildlife, to the preservation of wild species and their habitat and to promoting public education about captive wildlife issues.” (“Performing Animal Welfare Society -- PAWS,” 2016)

Riddle’s Elephant and Wildlife Sanctuary (Greenbrier, Arkansas):

“To provide a safe permanent haven for all elephants requiring sanctuary. To ensure that the knowledge and understanding of these endangered species is improved and developed, through education, training and study.” (“Mission Statement | Riddle’s Elephant and Wildlife Sanctuary,” 2016)

Two Tails Ranch (Williston, Florida):

“To provide for, learn and teach all about elephants, past, present and future. Our goal is to instill awareness through educational programs on site for schools and professionals in north central Florida.” (“About Two Tails Ranch | All About Elephants,” 2016a)

The National Elephant Center (Fellsmere, Florida):

“To improve the North American elephant population’s long-term health and welfare by providing and promoting excellence in elephant care and management.” (“About the National Elephant Center,” 2016)

Ringling Center for Elephant Conservation (Polk City, Florida):

“A lifelong symbol of The Greatest Show On Earth®, the Asian elephant is a respected and revered member of the Ringling Bros.® family. In the interest of the species’ present and future well-being, the Ringling Bros. and Barnum & Bailey Center for Elephant Conservation® was established in 1995. Located in central Florida, this 200-acre, state-of-the-art facility is dedicated to the conservation, breeding and understanding of these amazing animals.” (“About the CEC | Ringling Bros and Barnum & Bailey,” 2016)

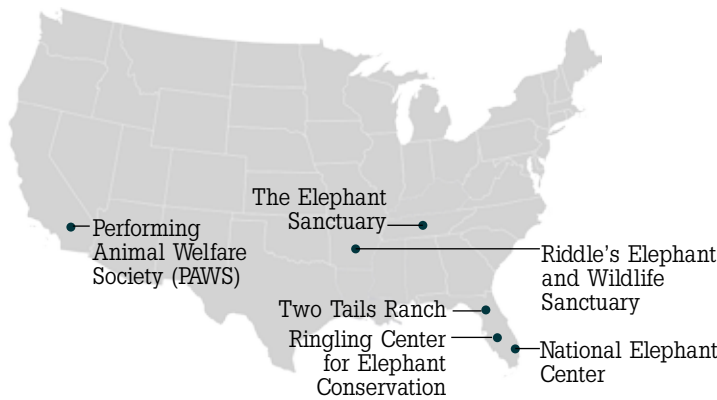


Figure 2.2: Existing United States Elephant Sanctuaries

HISTORY OF EXOTIC ANIMALS IN CAPTIVITY

In order to study the relationship between visitors and elephants in captivity, it is important to study the history of how the ownership of exotic animals came about, and the reasons people are still so intrigued by them. This section will review the history of zoos, and why certain exhibit design styles are popular today. This will partly explain why sanctuaries have become more ideal in visitors' minds.

The styles and design of zoos throughout the past three centuries have been explored by prioritizing

different needs. The idea of owning exotic animals first became apparent in Europe in the 1700s when royal menageries were a sign of status and wealth (Hancocks, 1971). These animal collections consisted of plain cages that each housed an exotic animal. The first of what people would call a modern zoo was London's zoological garden in 1830. At that time zoos were becoming very popular and started opening in the United States. In the late 1800s, naturalistic enclosures were popular. However, visitors started to express that they would like to see the animals up close. These demands led to the bar and cage exhibits in the early 1900s. Many of these kinds of enclosures are still seen in zoos today (Hancocks, 1971).

The 1900s saw the exploration of many different styles of exhibits, which still form the basis of how landscape architects approach zoo design. Visitors were intrigued by styles such as the "panorama styles", which utilizes moats instead of fencing in order for the viewer to have a panoramic view of many exhibits. In the 1950s was the first time that design started to focus on the animal, instead of the viewer, and many habitats were designed for animal behavior. There was a short period in the late 1900s where "bathroom style" and "modernist style" were tried. Bathroom styles focused only on sterile exhibits and not psychological health, therefore looking like a pristine square white tiled bathroom. Modernist style used architecture and technology to guide exhibit design. These styles are subtly used today, however the principles of each still play a minor role (Coe, 1996; McCray, 2002).



Figure 2.3: Ringling Brothers Circus - Elephants on their way from the menagerie tent to the Big Top in Madison, Wisconsin in 1950 (ChamaïneZoe's Marvelous Melange 2016)

MODERN EXHIBIT DESIGN

In 1976 immersive exhibits were introduced in zoos, and this style is now one of the most recent heavily used exhibit design. An immersive exhibit creates the illusion that a visitor is actually in the animal's habitat. The controlled views create a story as visitors meander throughout the exhibit. Designers use plants, sounds, and temperatures to engage all senses and depict a relationship between the animals and their native habitat. Although these habitats are engaging, many visitors complain that they cannot see the animals through all of the additional features. When planning for immersive design, the idea was that a surrounding natural habitat would result in the animal performing natural behaviors it would do in the wild. However, this technique only focuses on visitor experience (Coe, 2003; McCray, 2002).

Activity-based design focuses on the well-being of the animals, rather than the visitor. Enrichment is designed into the habitat, so that animals will perform natural behaviors. As a result, visitors are really paying attention to the animal, and getting the closest possible impression of how it would act in the wild (McCray, 2002). This approach to habitat design is new but gaining popularity among forward-thinking zoos. CLR, a landscape architecture firm specializing in exhibit design, has started utilizing activity-based design. This approach has proven successful so far in Denver's "Toyota Elephant Passage" and Dallas's "Elephants on the Savanna"(CLR, 2016). CLR states that their design is serving three clients: the visitor, animal, and staff that cares for the animal. The design must strike a balance between the three. Activity-based design allows for a different experience with each visit. It "lets animals be animals. They get to decide how they want to spend their day"(CLR, 2016). The activity-based approach is already practiced in elephant conservation centers, not because it is "cutting-edge" in habitat design, but because animal enrichment and care prompted the creation of sanctuaries.

Modern innovative zoos are focusing on conservation and education. They partner with other organizations around the world to conduct research on how to help the wild animal species of those in the zoo. Common missions include saving species from extinction and preserving species' natural habitats. This research can transfer into the zoo by educating the public on conservation issues. By focusing on conservation in addition to traditional operations, zoos generate public approval (Coe 1996).

ELEPHANT ENDANGERMENT

Elephants are an endangered species and experience a major threat from poaching, human-elephant conflict, and harmful tourism practices, mainly in Africa and Asia. In 1971, there were 1.3 million elephants, both wild and captive (Cohn, 2006). Since then, elephants have lost over fifty percent of their free range. There is very little, of what people think of “the wild,” left. Humans have encroached upon much of the elephant’s native land, converting it into agriculture and destroying native habitat. Elephants that infringe upon and damage the fields are often killed by farmers in retaliation. Because of this, almost all “wild” elephants now live on controlled preservation areas. The ivory market has a direct impact on the poaching of elephants. The ivory market was high in the 1950’s and 1970’s, and these decades saw a drastic decline in wild elephant populations (Sheldrick, 2012). The human-elephant conflict, along with massive ivory poaching has caused the population to drop significantly. Now there are only about 500,000 elephants left in the world (Cohn, 2006). It is projected that the wild elephants will be extinct in the next five to seven years (Two Tails Ranch, 2017). The hunt for ivory affects Asian elephant populations much more than African elephant populations. This is because only male Asian elephants have tusks, while both male and female African elephants have them. All poaching of the Asian elephant is directed at males, which has caused a major decline in their reproduction. There is one Asian to every ten African elephants (Reading and Miller, 2000). This endangerment has caused and encouraged the efforts of conservationists. Sanctuaries use this evidence to promote their breeding programs, research, and conservation programs. Conservation is often promoted through education and relation with the public.

Two hundred and eighty-eight elephants are living in the United States (Berens, 2012). The import of Asian elephants into the United States is illegal, and Asian elephants have not been imported since the 1970s. This means that the remaining 237 elephants kept in zoos, sanctuaries, and private farms are all the U.S. has left, and because of their age group, it is expected that 60% of elephants in North America will die in the next two to three years. To address these issues, conservation programs have initiated breeding and research. There are currently four facilities and multiple zoos with breeding programs. However, breeding programs have come “full circle,” meaning they no longer have the genetic diversity in the U.S. to continue breeding, and the younger elephant population is related, and cannot be bred together (Two Tails Ranch, 2017).

CONSERVATION AND EXPANSION

While visitors in the past have been excited about seeing an animal, today the ideas of animal activism are affecting the public’s view of zoos. This is true especially of elephants. Because of an elephant’s vast size compared to the small space they occupy in many zoos, elephant exhibits can stand out to visitors as being insufficient. These public views, along with many new laws and regulations being pushed by animal activist groups, are causing many zoos to expand their elephant exhibits. However, only the most successful zoos, found in large cities, are able to gain the funds to allow for these multi-million dollar expansions. Many people believe that the cost to space ratio of these expansions doesn’t make sense. Zoos spend millions of dollars to add only a few more acres to the exhibit (Cohn, 2006). In comparison, The Elephant Sanctuary in Tennessee expanded their facility from 200 acres to 2700 for \$6 million (“What’s All the Trumpeting About?,” 2003).

Zoos that do not expand their elephant exhibits are pressured to send their elephants to sanctuaries. Over the past decade, many zoos have closed their elephant exhibits, sending elephants to either sanctuaries or larger zoos that have the capacity for them. Elephant exhibits have been closed in large zoos in cities such as Toronto, San Francisco, Detroit, Chicago, Jackson, and Baton Rouge, as well as smaller zoos across the country. Many of these moves are made after failed fundraising to expand enclosures (PETA, 2016; PR Newswire, 2004). As views of animal in captivity shift toward having larger more interactive habitats, more and more large animals will be sent to sanctuaries. These sanctuaries that provide vast amounts of space will become a more popular attraction.



Figure 2.4: Three Elephants (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)

CURRENT ISSUES AND APPROACHES TO ELEPHANT HABITAT DESIGN

SPACE

The main issue expressed about elephant exhibits is insufficient space. Many activists claim that elephants in the wild walk fifty miles per day. The natural behavior of an elephant is to roam in search of food, water, and shelter. In zoos, they are not given this opportunity as they are confined to an exhibit of only a few acres. However, zoo directors state that most elephants don't usually walk fifty miles per day unless necessary. They have the capability to do so in the wild, as their main motivation is survival. When they are given regular meals without having to wonder, they will not perform the natural behaviors necessary to get food (Cohn, 2006).

SOCIAL GROUPS

There seems to be controversy over how much space is needed for an elephant to thrive. However, all current sources agree that elephants are social creatures. They crave emotional connection. Females can live in families containing around a hundred elephants. Zoos cannot house the number of elephants normally found in a kinship group. Solitude or having only one companion causes stress for an elephant (Cohn, 2006). Elephants also form a strong bond with each other while in captivity. Many of the elephants in captivity have known each other for ten plus years. Because of this, there is much effort put into keeping elephants together when they are transported to other facilities (PR Newswire, 2004). There are many misconceptions about Asian and African elephants. Asian and African elephants are actually able to coexist in exhibits and get along together just as one species normally would. Many zoos and sanctuaries have a single compound containing both species. However, there are a few differences in their needs. Asian elephants are smaller, and do not require as much space to roam (Gomez, 2016).

ENRICHMENT

Enrichment is defined by the Zoological Association of America (ZAA, 2016) as the “process for improving or enhancing the captive elephant environment within the context of the elephant's behavioral biology and natural history.” Incorporating enrichment into the habitat and daily routine encourages the development of natural behaviors, enhances social skills, promotes the ability to

cope with stress, and allows the elephant to feel a sense of control over its environment. Enrichment opportunities let elephants mimic the natural behaviors of their wild ancestors (Armstrong et al., 2016).

As activity-based design emerged, it became more apparent that it is enrichment opportunities, rather than space or habitat, that affects animal behavior. For example, a regular feeding schedule teaches an elephant that it does not have to walk to search for food. A regular feeding schedule is not natural, and in return, the elephant does not perform natural behaviors. Elephants in the wild cover themselves in dust, mud, and sand in order to protect themselves from bugs and the sun. When an it experiences daily cleaning, paired with exhibits that are not located in areas with these hazards, the elephant isn't inclined to dust itself. This lack of natural behaviors is what causes certain sicknesses specific to elephants in captivity. Zoos are providing enrichment activities, such as walking elephants around the park for several hours before opening. However, these enrichment activities are still not due to natural causes (Cohn, 2006).

To stimulate natural behaviors, habitats must provide opportunities for elephants to mimic the activities performed in the wild. Natural behaviors include social interactions, foraging, mud/dust bathing, climbing, swimming, and roaming for water, food, mates, and rubbing trees. Complex, informed habitat designs promote enrichment. Habitats should allow for social interaction. An elephant's exploration throughout the habitat should be rewarded with new and useful information. Habitats should encourage elephants to seek shelter, forage, and exercise. The goal of enrichment is to ensure that elephants are using their cognitive skills. Cognitive challenges may include training or solving a task (Armstrong et al., 2016). Landscape architects can make a meaningful difference in the enrichment features of a habitat. For instance, instead of having a regular feeding schedule where the elephants know where and when to arrive for food, landscape architects can encourage elephants to perform a variety of movements through providing varying spaces for concealed food that requires foraging.

CLIMATE

Many zoos in the north, such as Detroit, are realizing they cannot sustain their elephant exhibits because of the extreme winter climate. The native climate of an elephant is mild, and cold, wet conditions cause arthritis in elephants. Detroit stated that their two elephants were in need of milder conditions, and were sent to the PAWS sanctuary in California (PR Newswire, 2004). The Tennessee Elephant is better suited for elephants because the climate and vegetation are similar to their native homes. The Sanctuary provides heated barns for Tennessee's short winter (“What's All the Trumpeting About?,” 2003)



STANDARD ELEPHANT CARE AND NEEDS

The Zoological Association of America (ZAA) standards are used as the main resource for elephant needs and habitat requirements. ZAA is chosen among other accreditation organizations because of its recommendation from people involved in the elephant industry, and its detailed information regarding design and spatial features of the habitat. ZAA guidelines are reviewed to gain general information on safety and health standards widely accepted by the zoological community. Standards for Animal Class I (which includes elephants) are reviewed and summarized to inform design decisions. The ZAA standards have adopted the Elephant Husbandry Resource Guide as their husbandry standards. This guide is a compiled from the support of the Association of Zoos and Aquariums (AZA), Elephant Manager's Association (EMA), and International Elephant Foundation (IEF). These standards contain extensive detail relating to the design of an elephant care facility, and these standards will influence the programmatic and spatial features of the design. AZA standards are also considered and compared as a supplementary guide, but will have minimal influence due to its lack in specific elephant facility recommendations. It is not a goal for the final design to be accredited, however these standards are very well known and accepted throughout the exotic animal industry.

OUTDOOR ENCLOSURES

The outdoor enclosure, or paddock, is where the elephants spend most of their day, feeding, moving around, and interacting with one another. The attitude towards outdoor enclosures is that they should be as large as possible. In 2006, the AZA required 1800 square feet of space for an elephant (Cohn, 2006). This is also the case with the Husbandry Resource Guide standards (Armstrong et al., 2016). In their current standards document, the AZA has increased this minimum to 5400 square feet per elephant, due to the controversy around the topic. The document does make general statements that require enough space for certain activities to occur, leaving the designer to specify how much space these activities require.

“There is no scientific data which clearly indicates the amount of space needed for an elephant to be healthy and well adjusted. It is the quality of the overall programmatic approach to good elephant management and the quality of the space from an elephant perspective that determines adequacy of the facility, not simply the square footage of the environment. Thus, if the elephants are healthy and socially adapted, then whatever is being provided meets the standard. It is inaccurate to say that because a facility has a certain amount of space, then it has good elephant management” (AZA, 2012).

There should be at least one large yard for females, and a separate one for adult males. Additional yards should be adjacent to the large communal yards to be used as necessary for breeding couples, aggressive elephants, or new mothers and their calves (Armstrong et al., 2016). An outdoor enclosure must provide shade to escape the sun, water for drinking and bathing, and scratching posts that may be strategically located near bathing water. Visual barriers may be natural or architectural, but must be large enough to separate themselves from others. Corners of barriers should be more than ninety degrees to allow elephant to remove itself. There must also be dust or sand available for elephants to dust themselves. This assists with thermo-regulation and protect themselves from insects. Wallows, or shallow mud pools, should also be provided for the same purpose. Water should be provided in the forms of pools, waterfalls, and misters. There should be a separate drinking water source. It is recommended that pools be deep enough for an elephant to fully submerge itself, with minimum dimensions of 30 by 30 feet. All pools should have more than one entry/exit. They must be built of non-slip surfaces (broom-swept concrete), with less than a thirty-degree slope (Armstrong et al., 2016). All steps should be wide enough for more than one elephant's foot at a time, but small enough for baby elephants to climb. Pools without rounded edges and no corners are recommended (AZA 2012).

The outdoor enclosures must provide a varied terrain that is complex enough to provide opportunities for exercise. There terrain must incorporate natural large sturdy objects such as rocks and tree stumps to cause natural foot wear, and provide objects for scratching and rubbing (AZA, 2012). Ground materials

should be primarily natural substrates, such as dirt, grass, clay, coarse sand. Yards should provide good drainage without being too steep. Each yard should include a dry, cleanable area for feeding (Armstrong et al., 2016). The new “Giants of the Savanna exhibit in the Dallas Zoo provides dirt that is seven feet deep to allow the elephants to dig (Flick, 2010). Modern exhibits are utilizing new rubberized compounds or polymer aggregate topping laid over concrete. All ground surfaces, both indoor and outdoor, must have excellent drainage and dry quickly. This is because standing water can cause foot infections in the elephants, which is very common in captivity (“Exhibit Design,” 2010).

INDOOR ENCLOSURES

Elephants will occupy indoor holding facilities in the event of inclement weather and sometimes care practices by handlers. Indoor space may be made of up large, open community stalls, or individual stalls. Female stalls should not have solid walls to allow interaction, and be at least 400 square feet per elephant. Male stalls shall be more solid to prohibit aggressive behavior while still allowing the handler to see inside, and be no less than 600 square feet. The minimum height of the ceiling and object protruding from the ceiling shall be at least twenty feet to allow the movement of elephants. Indoor space should be well lit enough for staff to safely move around and care for the elephants. Skylights are recommended, as well as artificial light as necessary. All indoor temperatures must be at least 55 degrees Fahrenheit, with one room that can maintain a temperature of 70 degrees for the shelter of sick elephants. Elephants should be provided with heat sources when the outdoor temperature drops below 40 degrees. This could be in the form of heated floors (Armstrong et al., 2016). It has now become a standard that newer exhibits provide holding spaces for males, minimizing the need for tethering.

BARRIERS

Barriers must be strong enough to withhold an adult elephant’s strength, and prohibit an elephant climbing over it. Designers should keep in mind that an elephant can reach ten to twelve feet outside the barrier. Walls containing females should be six feet tall, and those containing males should be eight feet tall. Barriers should be made of concrete, rock walls, vertical posts, horizontal steel rails, pipe or cable enforced with vertical posts. When designing spacing between posts, the allowance of emergency keeper exit should be considered. Electric fence features may be used as a secondary form of barrier. If a moat is incorporated into the design of a barrier, it must be designed in a way to inhibit the injury or trapping of an elephant (Armstrong et al., 2016).

FEEDING

The primary diet of elephants in captivity consists of hay and produce. Some facilities offer supplemental pellets, treats, or bread as a partial replacement to its primary diet. An elephant’s food intake ranges, but is on average about 2% of its body weight per day. Obesity is a large issue with many elephants in zoos. It is in an elephant’s nature to constantly graze. This combined with lack of exercise contributes to obesity. Food should be provided on a clean concrete pad, as feeding on natural substrate could lead to sand consumption (Armstrong et al., 2016). The AZA recommends automated feeders, such as hanging feeder nets, and other feeding tactics that encourage natural behaviors such as searching, browsing, grazing, reaching, and opening (AZA, 2012). This standard reinforces the practices of activity-based design.



Figure 2.6: Guided Walk through the CEC (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)

PUBLIC EDUCATION AND HABITAT DESIGN

There is a plentiful amount of research on public exhibits in zoos, and how they can promote conservation and education (Bitgood, Patterson, & Benefield, 1988; Claxton, 2011; Coe, 2003; Flick, 2010; Hamilton, 1993; Hyson, 1999; Lessow, 1990; McCarthy, 2012; Nichols, 1996). There is very little research on the effects of larger scale sanctuaries, and how they can support public education. For this reason, many of the following studies are focused on zoos. Much of the following information pertaining to the relationships between animals, visitors, and site design can be viewed generally, and may apply to an elephant sanctuary.

Sources on exhibit design seem to put emphasis on either visitor experience or animal behavior. It seems that in the future, designers will seek a balance between these two priorities. The habitat should somewhat mimic the natural environment of the elephants, while still being reasonably maintainable (Hamilton, 1993). This match of animal and their environment will reinforce the exotic pairing in the visitor's mind. In order to more fully engage visitors, while also maintaining elephant health, natural enrichment should be implemented into the habitat. A successful exhibit will have behavioral, environmental, aesthetic, and utilitarian qualities. Within the habitat, animals shall be visible and well adjusted. The exhibit should be educationally valuable and all graphics should support its goals. The environment should promote animal activity and interaction, as well as address animal needs. The exhibit should be aesthetically pleasing to the public. The design of the exhibit should be easy to maintain, contain adequate holding facilities, be safe for occupants and visitors, and address habitat issues (Hamilton, 1993).

The modern mission of organizations with animals in captivity is conservation, education, research, and preservation (McCarthy, 2012). Landscape architects face several challenges when incorporating education into the design of an exhibit. An exhibit is considered efficient when it meets the biological psychological needs of the animals, requirements of the visitors, and is maintainable (Hamilton, 1993). The main goal of an educational exhibit is to make a lasting impact in the visitor. Although zoos and sanctuaries strive to educate visitors, animals in captivity are an attraction. Families are going to consider their visit as a family outing, rather than an educational opportunity. However, an exhibit needs to take advantage of its recreational reputation in order to educate the public (Hyson, 1999). Educational tactics can be more appeal through entertainment. Appropriate elephant performances can be a crowd pleaser, as well as an opportunity for the elephant to exercise and improve its cognitive abilities. Most organizations also find it acceptable to offer elephant rides to visitors, however this requires necessary training and supervision. Rides and up-close encounters encourages visitors to experience the “awe” of an elephant. Visitors may form a bond or emotional attachment to the species,



Figure 2.7: Baby Elephant Playing at the CEC (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)

therefore wishing to protect it. Performances are also an opportunity for handlers to educate the public on handling and care techniques, and why they are important (Armstrong et al., 2016).

In order to create the highest potential for education, the educational themes must be apparent and obvious to visitors. These themes shall be carried out throughout the entire design to frame the visitor experience (Lessow, 1990). On the other hand, a well-planned exhibit will also provide subtle lessons (Hamilton, 1993). To guide interaction between the visitor and elephant, an exhibit design shall promote observation, demonstration, informational graphics,

and multi-sensory participation. The exhibit needs to be design for all demographics, pertaining to gender and age (Lessow, 1990). Animals need to be active, and visitors want to see active animals. The challenge in exhibit design is to make both these things happen at the same time. Animals tend to be more active in the morning and evening, while most people will visit in the afternoon. Design and enrichment plans can have an impact on when animal behaviors occur. Designers must study the animal's natural behavior in the wild, and manipulate this behavior in captivity to promote visitor interest (Flick, 2010).

Good exhibits give narrative to the animal and its native environment. An exhibit design affects the way the public views an animal. For example, an animal in a cage may appear more like a criminal than a grazing animal. Certain exhibit elements seem to be more intriguing to viewers. Visibility and proximity have a direct impact on visitor interest. Several viewing areas are necessary to allow for views from multiple vantage points (Lessow, 1990). However, having to locate an animal in its habitat provides knowledge about how it interacts within its own ecological system (Hamilton, 1993). Generally, visitors are more engaged when the animal is larger and more active (Lessow, 1990). The public enjoys seeing animal-to-animal interaction as well (Hamilton, 1993). Infant animals also grab attention. After gaining attention, habitats must maintain engagement through interactive features and demonstrations (Lessow, 1990).

CENTRAL FLORIDA TOURISM

Tourism is the largest industry in Florida, with tens of millions of visitors each year. These visitors spend billions of dollars on goods and services in the state. Central Florida is popular for its theme park attractions. Walt Disney World, Seaworld, and Universal Studios are just a few places in Central Florida which attract visitors from all over the world (Milman & Pizam, 1988). Ringling CEO, Kenneth Feld believes that if it were to be opened to the public, Orlando's already thriving tourism would spill into the CEC (Ager, 2015). Tourism in Central Florida is expected to expand. In a survey done at the University of Central Florida, 78% of residents living near these attractions favored the presence of tourism in the region. Residents agreed that employment opportunities, income, tax revenue, and quality of life improved because of tourism. Traffic, crime, and alcoholism were seen as worsened About 14% of households have someone who works for the tourism industry (Milman & Pizam, 1988).

VOLUNTOURISM

Volunteer tourism, or “voluntourism” is the combination of volunteer service during travel (Brown, 2005). The activity became popular in the 1990s, and continues to grow partly because of students taking gap years during their education. Motivational factors for doing voluntourism are the desire to help the environment and work with communities in less developed countries. Other factors such as self enhancement, social interaction, development of personal skills, and independence are also important to voluntourists (Daldeniz & Hampton, 2010). The interest in volunteering while on vacation comes from tourists who have become bored with standard vacation packages, and are looking for more unique travel experiences. People are interested in getting to know the local people and understanding the culture of the places they visit. Many charities have teamed up with tour operators to create vacations centered around fundraising and volunteering. There are three factors of variance in voluntourism: intensity of labor, level of interaction with population served, and degree of skill required. In order to have a well-organized volunteer vacation, organizations must balance the desire for intrinsic and extrinsic rewards and manage large numbers of short-term workers. An organization should direct its focus to one specific cause, in order to increase passion and dedication to the cause in its volunteers (Brown, 2005). Several opportunities exist to volunteer with elephants in Asia and Africa. Conservation projects aim to educate the local population, preserve habitats, and separate elephants from villages. This is of interest to people passionate about elephant conservation and travel. Volunteers assist with field research, building enclosures, preparing food, and other activities that directly affect the elephants. There are only a few opportunities to volunteer with elephants in the United States, and no sanctuaries offer direct contact with the elephants (Beck, 2016).

RINGLING BROS. CENTER FOR ELEPHANT CONSERVATION

The Ringling Center for Elephant Conservation (CEC) was established in 1995 for the purpose of reproduction, retirement, and study of the Asian elephant (Feld Entertainment, n.d.). This \$5 million gated facility is currently home to forty-two Asian elephants (Scigliano, 2002; Two Tails Ranch, 2017). Trudy Williams, Ringling's animal stewardship manager, says that the goal of the center is to “make it so that the Asian elephant is existing in the western hemisphere for everyone to see. We want our grandchildren to be able to see the Asian elephant” (Ager, 2015).

ELEPHANT RETIREMENT

Rising animal activism movements and increasing city regulations on the treatment of elephants have tightened restrictions on the Ringling Circus. The arrival of the circus to a new town often had to be kept secret to avoid protesters. Dennis Schmitt, a leading elephant veterinarian, says that due to increased exercise during shows, captive elephants in circuses have proven to be healthier than those in zoos. However, animal activists see forcing elephants to do tricks as animal cruelty (Scigliano, 2002). In March 2015, the Ringling Circus announced the retirement of their thirteen performing circus elephants. By May 2016, the elephants were retired to the Ringling Center for Elephant Conservation (CEC) in central Florida. Before this announcement, the Center already contained thirty-nine elephants, retired Ringling performers. This 200-acre conservation center is now home to the largest herd of Asian elephants in North America (Ager, 2015). Following the retirement of the Ringling elephants, ticket sales have dramatically declined. In January 2017, Kenneth Feld, owner of the Ringling Circus, announced that the circus will close after over one hundred years in operation. The final show will be held in May 2017 (Feld, 2017).

RESEARCH

One of the main goals of the CEC is conservation. Having a large herd of elephants allows the center to perform research to maintain the species. The CEC partners with the government of Sri Lanka, a small Asian nation with large human-elephant conflicts. Ringling and Sri Lanka Department of Wildlife Conservation are working together to come up with solutions for these conflicts (“About the CEC | Ringling Bros and Barnum & Bailey,” 2016). The CEC is the leading elephant-breeder in the Americas. Because of laws regulating exotic animals brought into the country, as well as the large proportion of elephants in America reaching old age, breeding in America is not currently sustainable. The U.S. will be down to about ten elephants in forty years (Scigliano, 2002). Twenty-six elephants

have been born at the center because of this research. Ringling partners with other zoos and facilities to encourage and preserve genetic diversity among the calves (“About the CEC | Ringling Bros and Barnum & Bailey,” 2016). The center is currently focusing on how elephant genes can contribute to cancer research. Since cancer in elephants is so rare, scientists have begun studying their genes to examine what protects these massive creatures. Ringling has contributed \$250,000 so far to cancer research. The research aspect is also an opportunity to educate the public (Feld Entertainment, n.d.).

CARE

Care is provided for elephants at the CEC by a number of different veterinarians and staff. Elephants are provided with veterinary attention, nutritious meals, and clean living quarters. The daily routine at the CEC consists of barn cleaning by staff, feeding and watering in the morning, walking elephants in compatible groups, playtime, baths, put to bed in elephant barns, and feeding at night. Opportunities for mental and physical stimulation are provided through play and social interaction. Veterinarians work to prevent, diagnose, and treat EEVH (a herpes virus) and tuberculosis, the two greatest threats to elephant health.

CURRENT SITE FEATURES/PROGRAMMING

The CEC is currently a 200-acre working farm, consisting of minimal necessary enclosures. The site features five outside paddock areas and four buildings for elephants. Paddock areas provide shade and drinking water, and are interconnected by thirty-seven gates and walkways for elephants to safely move between paddocks. The main barn is 17,000 square feet. It includes birthing facilities, two workshop areas, a feed storage room, and an elevated room that serves as an office, lab, and observation room. The large barn also as an automated animal waste removal system. There are two smaller 3,100 square foot barns, and a 4,900 square foot double male elephant barn. All areas for the elephants provide spaces for shade, sleeping, grooming, and feeding.

REASONING FOR PUBLIC ENTRANCE

The CEC is currently closed to the public. Now that the elephants have been retired and the circus will soon close, Ringling representatives are not sure what is next for the public relationship to these animals. “The company wants to find ways for people to see them again, but doesn’t know where or when that might be possible” (Ewan, 2015). “That’s what our next thing is. How can more people appreciate these elephants now that they’re not on the circus? And how can they go and see them someplace and be close to them and understand them?” says Kenneth Feld, Ringling CEO (Henderson, 2016). Feld told National Geographic that he aims to someday show tourists the grandeur of the Asian elephant, if not at the current center then someplace nearby (Ager 2015). Allowing small numbers of visitors to the center may provide enough benefits, such as public understanding and charitable

contributions, to balance the negative association with animals in captivity. Elephants are the largest animal on land, and therefore caring for them places a large financial burden on Ringling. It costs \$65,000 per year to care for one elephant, and this does not include building its habitat. Male elephants live alone, and need individual barns and shelters. Each male elephant’s habitat costs Ringling \$1 million (Ager, 2015). Although Feld Entertainment (owner of Ringling) produces great profits each year, the renovations for the center must be financially feasible. The main challenge will be to engage the visitors with a very personal, unique experience while still maintaining peace for the elephants. To achieve this, very specific programming and scheduling must be designed into the site. In order to accommodate this growing herd of elephants as well as visitors and staff, the site will need to be expanded.

BASIC ELEPHANT CARE COSTS

Elephant Care:	Annual Cost Per Elephant:
Food and Care	\$70,000
Care for Old or Unhealthy Elephant	\$100,000
Elephant Transportation	\$15,000-\$50,000
Infrastructure:	Cost per Item:
Barn (20,000 sq. ft.)	\$750,000
Fencing (100 acres)	\$1,000,000
Pond	\$300,000
Additional Infrastructure	\$300,000
Staff:	Average Annual Salary:
Keeper	\$40,000
Veterinarian	\$90,000

This information is based on PAWS Wildlife Sanctuaries Costs for Elephants (Paws 2017. <http://www.pawsweb.org/careandmanagement.html>) and Inside Jobs (<http://www.insidejobs.com/careers/elephant-trainer>).

CHAPTER 3 *METHODOLOGY*



Figure 3.1: Two Tails Ranch Sculpture

In order to understand how informed habitat design can contribute to conservation efforts and provide opportunities for interaction between animals and visitors in an elephant sanctuary, a projective site design will be developed. To inform the projective site design, the following data collection methods are used: site analysis, precedent studies, analysis of zoo design guidelines, and a financial analysis of operational costs. Findings of this research give direction to the final site design outcome.

SITE ANALYSIS: DATA COLLECTION

Several attempts have been made to acquire information directly from employees at the CEC. Ringling has had a great deal of attention from the press due to its recent retirement and closing announcements, and undergone extreme criticism from animal activism groups. The CEC is also a working farm, and is extremely selective of its visitors. Basic information was received from employees at the CEC, which informs this report. However, I was not able to directly meet with employees or visit the site of the CEC to gain more in-depth knowledge. Investigative research, as well as educated assumptions inform the proposed site design of the CEC.



Figure 3.2: CEC Baby Elephant (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)

The first step in the design process is to analyze the current CEC site and facility. The goal of this analysis is to identify opportunities and constraints for the projective site design. Specific factors were chosen with the goals and intentions for the final design in mind. The site factors chosen are described in the table below (Figure 3.3).



Figure 3.3: Site Inventory and Analysis Factors

PRECEDENT STUDIES

A precedent study is an analysis done of a particular method or theory in order to serve as an example to justify its use in a new design. In this project, precedents of unique existing animal attractions are analyzed to find: practices that have been implemented in contemporary exhibit design; various models of conservation tourism; and design features of other animal attractions. The goal of these precedent studies is to collect applicable design strategies for tourist experience and elephant conservation to be implemented into the projective design. Features important for an elephant conservation center design include habitat, exhibit, visitor experience, and financial strategy. These features provide a framework for selecting and analyzing precedents. Five precedents were selected for analysis because each thrives in at least one of these features. They are used to collect strategies for these features to be used in the projective design. Precedents include: The Elephants of the Zambezi River Valley, Kilimanjaro Safari, Two Tails Ranch, Jaguar Rescue Center, and Elephant Nature Park. Each precedent is analyzed according to the features it was selected for. Figure 3.3 on page 33 is a comprehensive diagram of precedent sites used to collect information on features. A further explanation of these analysis features, as well as data collection techniques for each precedent are described below.

PRECEDENT ANALYSIS FRAMEWORK

Habitat: What features should a habitat provide to keep it elephants healthy?

The habitat is the confined area that the elephants occupy and includes anywhere the elephant can move within the enclosure. The features of the habitat influence how elephants interact with their surroundings, determine how they spend their day, and ultimately affect their health and happiness. Important factors include the number of elephants, space, enrichment activities, materiality and water accessibility. Enrichment activities include elements and materials that elephants can have natural interaction with, as well as exercise activities directed by the keeper. Materiality of the habitat includes things such as ground cover and other terrain. These precedents help to inform the question of what elements a sanctuary should provide to keep its elephants healthy.

Exhibit: What features of an exhibit provide guidance, education, and aesthetic qualities?

The exhibit is the design of the area surrounding the habitat that the visitors occupy. It influences the way visitors interact with the site and animals, and can determine what kind of experience they have with the animals. Pathways determine routes visitors take. Guidance features leading visitors toward and around the exhibit also play a role in which routes visitors take. Informative and educational signage impacts how visitors view the animals, and is key to educating the public about conservation issues. Enclosure techniques impact how a habitat and animal is perceived. Bars and cages may yield a sense of danger or separation, while the appearance of an open grazing field can invoke serenity. The enclosure techniques also regulate the views and sight levels throughout an exhibit. Views can be intentionally

directed or framed by design. Site levels, or height at which the animal is viewed, can make the visitor feel dominant or inferior. Materiality that visitors see and touch influences the atmosphere and impression of the exhibit. Materials used in exhibits often mimic the animal's native habitat or country. Materiality can be used strategically to evoke associations between the animals and where they come from. Sounds produced by the exhibit can also be a component of the materials portrayed.

Visitor Experience: What kinds of programs and tours are beneficial to visitor experience and how can design accommodate these programs?

Visitor experience focuses on activities and programming planned specifically for guests. This category focuses specifically on worker-visitor interaction, rather than interaction with animals. Experience features include tour and guidance techniques, educational programs, and accommodations. The number of visitors per year is also an important factor. Programming is how visitors spend their day, which is planned intentionally by the staff. Educational programs are specific to educating the public on the animal and conservation efforts. The strategies used to present information on tours are the presentation techniques. Accommodations apply when additional amenities are offered to guests. These could be rooms to stay, meals, or transportation.

Finance: How do organizations similar to the CEC operate financially?

Financial records of organizations are reviewed to determine operational costs, income, funding, donations, and average building costs. This information may contribute to justification of allowing visitors into elephant sanctuaries. Operational costs are how much it takes to maintain and run the facilities. Income is how much the facility brings in through admission and purchases made by visitors. Funding is relevant if the organization receives any outside help from the government or other private donations. Donations are how much the organization donates to conservation. Building costs describe the investment made in construction and materials for containing elephants.

TECHNIQUES FOR DATA COLLECTION

The Elephants of the Zambezi River Valley | Sedgwick County Zoo | Wichita, KS

The Zambezi River Valley is a multi-species exhibit that recently opened in May 2016. The habitat contains five acres of space, and the largest elephant pool in the world. Zambezi River Valley is one of the most recently built elephant exhibits in the United States, and has the most up to date research about elephant welfare. The exhibit was designed by GLMV architects. The experiential and immersive design allows visitors to be surrounded by up to seven elephants, on land and on water in a river boat. The exhibit covers eleven acres, featuring two large yards, a soft-surface barn, and guest viewing pavilion (GLMV Architects, 2016).

Preparation Data Collection:

- Informal examination of maps found online
- Review of exhibit facts on zoo's website

On-Site Data Collection:

- Brief walk through to gain sense of scale and layout
- Informal site map drawing
- Placement, proportion, and description of site features
- Rough sketch of barriers
- Photos of barriers, elephants, barn, materiality, and signage

Kilimanjaro Safari | Animal Kingdom, Walt Disney World | Orlando, FL

The Kilimanjaro Safari is a Disney attraction featuring a realistic safari ride across 100 acres of simulated African grasslands. Walt Disney World is known for their precision of design. Every single detail in the park is intentional and designed to have an impact on the visitor. While the animals seem to be roaming freely, each group is contained by cleverly disguised barriers, moats, and fencing (Corsello, 2016). This precedent was selected because of the immersive design of the safari ride, including materiality, views, and enclosure strategies, and also the surrounding elements guiding visitors.

Preparation Data Collection:

- Informal examination of maps found online
- Review of ride facts online

On-Site Data Collection:

- Photos entering through the park, in line, and during ride
- Informal notes over existing site map diagram from outside source
- Rough sketches of enclosure techniques
- Audio recording of tour guide

Two Tails Ranch | Williston, FL

Two Tails Ranch is an elephant sanctuary that temporarily or permanently houses elephants in retirement, entertainment, and from zoos. The ranch was founded in 1984 by Theodore Svertesky and Patricia Zerbini, and has been opened to the public since 2009. The ranch hosts educational programs, and allows visitors to get up close and personal with the elephants ("About Two Tails Ranch | All About Elephants," 2016b).

Preparation Data Collection:

- Schedule Appointment
- Review facts on organization's website
- Gather financial information on organization's website

On-Site Data Collection:

- Photos of elephants, enclosures, and materiality throughout tour
- Audio recording of tour guide
- Conversation with owner of organization

Jaguar Rescue Center | Limón Province, Costa Rica

The Jaguar Rescue Center provides a temporary or permanent home to animals who have been injured or orphaned in the wild. The center takes in animals from the rainforest all over Costa Rica and the surrounding Caribbean region. The species at the center range from birds, small primates, amphibians, reptiles, and some small cat species. The center offers a public and private tour.

Preparation Data Collection:

- Review facts on organization's website

On-Site Data Collection:

- Photos of animals and materiality throughout tour
- Informal written recording of tour information and techniques observed
- Conversation with tour guide

Elephant Nature Park | Chiang Mai, Thailand

Elephant Nature Park mainly provides sanctuary for distressed elephants, but also other rescued species. The park is also committed to rainforest restoration, cultural preservation, and visitor education. The park offers many different visitor and volunteer experiences, ranging from one day to one week. Analysis of the park for this report will cover the programming and activities for the visitors, pricing, budget, and accommodations (Elephant Nature Park, 2016).

No Site Visit

Data Collection:

- Gather financial information on organization's website
- Review program options and accommodations on organization's website

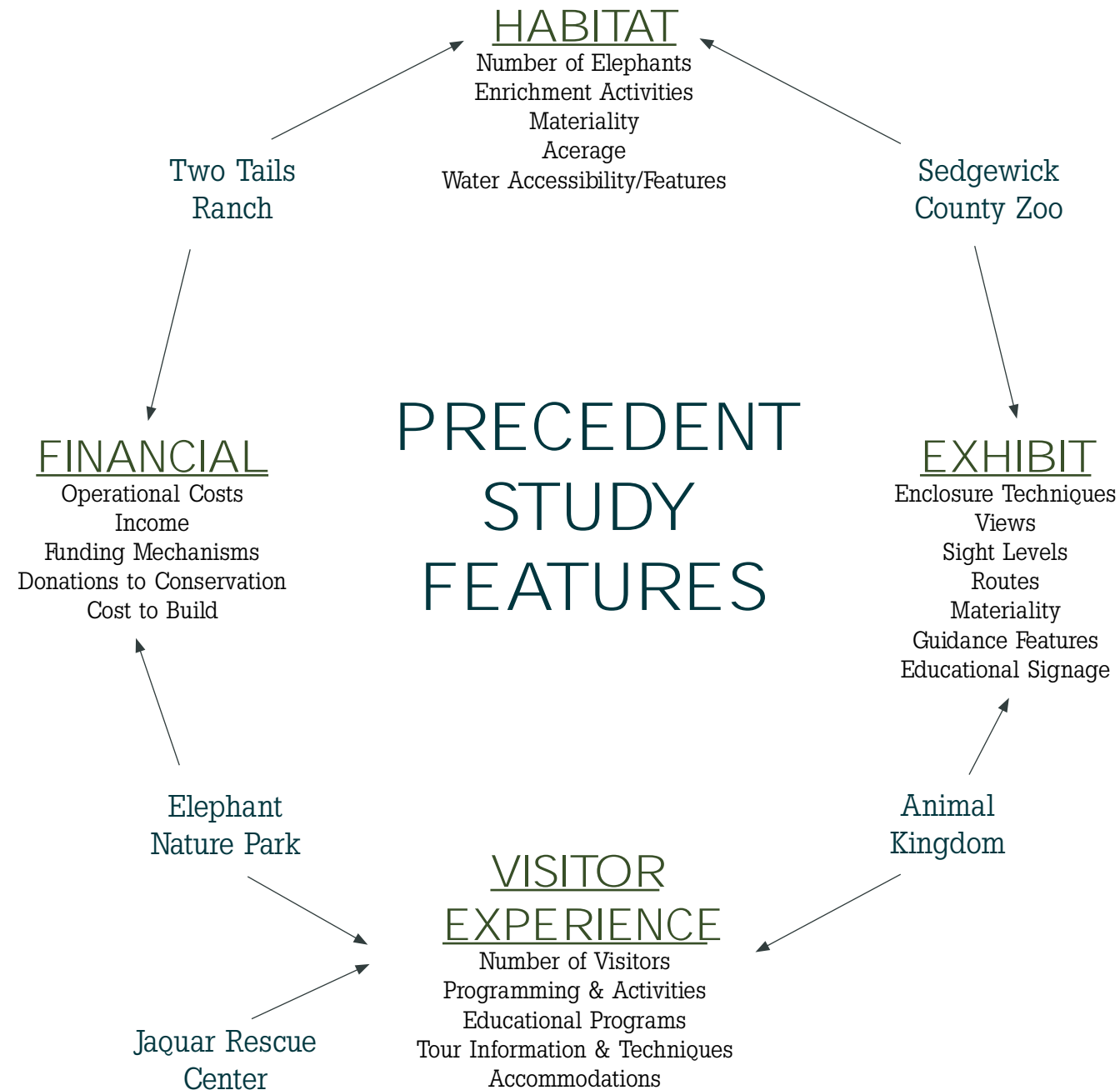


Figure 3.4: Precedent Study Factors

ANALYSIS OF GUIDELINES FOR VISITOR EXPERIENCE

In 2012, Kansas State Master of Landscape Architecture student Russell Ploutz wrote “Achieving Conservation: New Cognitive Based Zoo Design Guidelines” (Ploutz 2012). These guidelines study the way we learn and how to incorporate this learning process into an exhibit design. They have been synthesized from literary sources and provide support for design decisions. By analyzing these guidelines from an elephant exhibit perspective, a framework is developed for designing an elephant conservation center. Each guideline is reviewed and annotated based on how it may apply to the CEC design. Select guidelines will help inform and guide the design of the visitor experience and learning opportunities within the projective design. Informal notes are taken for reference during the design process. A summary is discussed in the next chapter of this report. Applied guidelines are used as evidence and support the Design chapter of this report.

FINANCIAL ANALYSIS

A financial analysis is conducted in order to determine the potential income for the CEC if it were to add a tourism component to its existing facility. The first step in the financial analysis is to inventory the entrance fees and other experience costs of animal attractions. During precedent analysis, Elephant Nature Park and Two Tails Ranch are reviewed for their financial operations. On top of these two main example organizations, others are analyzed for costs of experience. Organizations that have similar programs to the programs of the new CEC are chosen for analysis. Pricing information is found on the organizations' websites. An inventory of program and experience prices are inventoried and used to make pricing decisions for the new CEC. These example organizations provide awareness for suggesting fees for entrance, overnight stay, and additional programs for the new CEC. Average daily visitor attendance is based on an informal tally of attendance during precedent site visits. The combination of pricing and attendance information gives a range of potential revenue for the new CEC.

In conjunction with this external analysis, an internal analysis specific to the CEC's assumed costs of operation is calculated and used to determine potential profit. Cost of elephant care is found through the CEC's website. Salary information for current and potential employees of the CEC is found through Glass Door, a website that contains employment information. After calculating average potential annual revenue and average annual expenses, an estimate of potential profit can be made.

CHAPTER 4

FINDINGS



Figure 4.1: Animal Kingdom Bike Wall

The findings in this chapter contribute to the design for the new Ringling Center for Elephant Conservation. Methods discussed in the previous chapter are executed and summarized under these findings. Each finding is concluded with key findings for design. These key findings are synthesized as key lessons applicable to an elephant conservation center, and they are used to inform the CEC design.

SITE ANALYSIS

EXISTING PROGRAMMING AT THE CEC FACILITY

42 Elephants

200 Acres

5 Paddock Areas

37 Gates and Walkways for Safety

30 Enclosures

- Shade Structures
- Balls, Tires, and Branches for Toys
- Dirt and Sand Piles

17,000 Sq. Ft. Main Barn

- Birthing facilities
- Automated animal waste removal system
- Elevated office/lab/observation room
- Feed storage room
- 2 workshop areas

2 3,100 Sq. Ft. Male Elephant Barns

4,900 Sq. Ft. Double Male Elephant Barn

1 Administration Building

- Office
- Lab
- Kitchen

Multiple Sheds and Storage Areas

50 Parking Spots Available for Vehicles

54,800 Sq. Ft. for Growing Elephant Food On Site

EXISTING FACILITY

The current Center for Elephant Conservation consists of a central barn and enclosure area surrounded by open land. Elephants remain in their barns at night, spend their days in their appropriate enclosures, and are walked around the rest of the property by trainers daily. Enclosures contain shade structures, toys, dust piles, and sometimes small pools. Elephants are kept in their appropriate social groups. To ensure safety, outside paddocks are connected to barns by a series of chutes to move male elephants from one area to another. At times that the open land is flooded, elephants are let out to wade in the shallow wetlands. Some elephant treats such as bananas and elephant grass are grown directly on the property.



Figure 4.2: CEC Aerial (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)



Figure 4.3: Elephant Bath (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)



Figure 4.4: Elephant Shade Structure (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)



Figure 4.5: CEC Entrance Sign (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)



Figure 4.6: Existing CEC Site Features

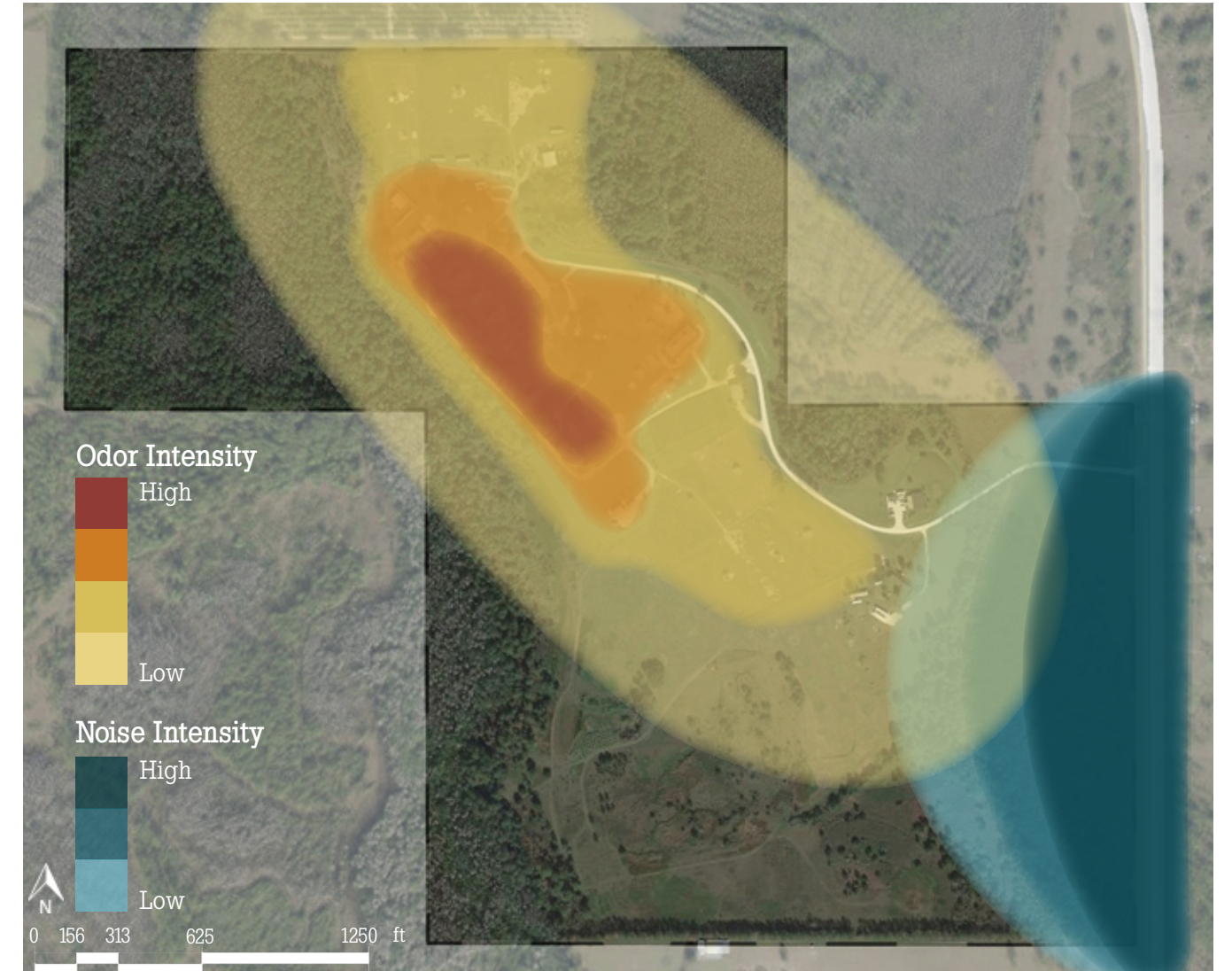
SENSORY



Views

The current CEC contains views of forests, pastures, and light infrastructure. The view to the north is a crop field, and most other views off of the site are forests. Light infrastructure in the existing CEC consists of barns, bar enclosures, gravel roads, and some buildings. Forests are natural wetlands made up of deciduous, palm, and evergreen trees. Pastures consist of natural grasses and sparse shrubs.

Figure 4.7: Views



Odor & Noise

The existing barn area contains the most elephants within the most condensed space. It is assumed that most odors come from this barn area. Additional odors may originate at larger elephant enclosures surrounding the barns. Noise is assumed to come from the adjacent highway. Since this is an agricultural area, noise levels will be altogether low.

Figure 4.8: Odor & Noise

NATURAL

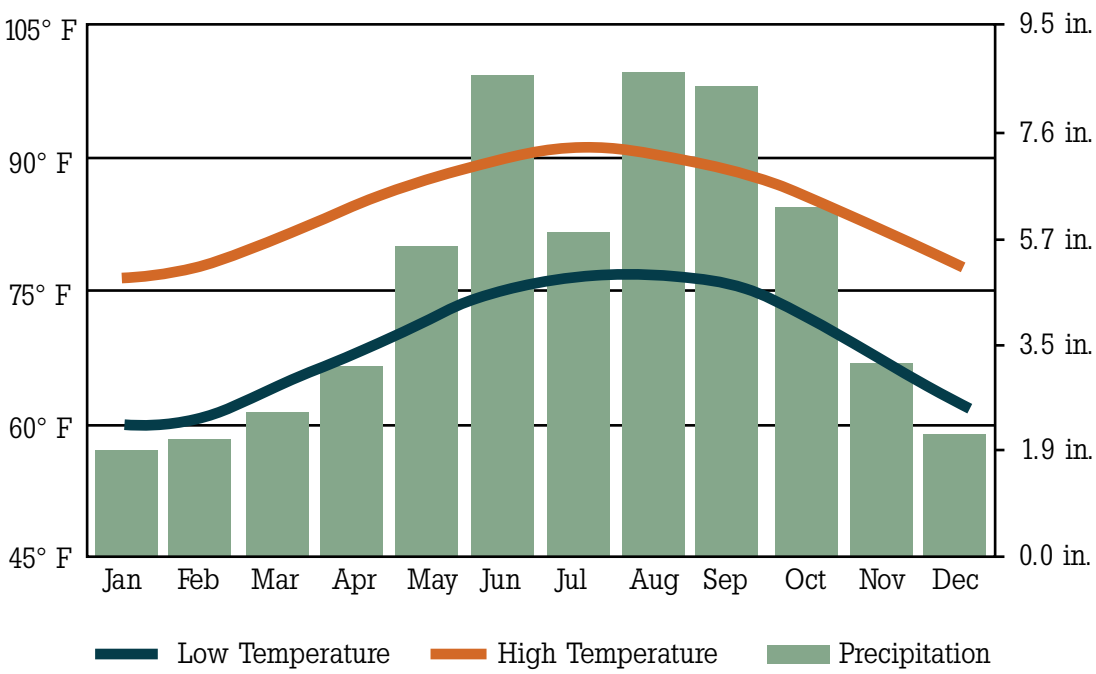


Figure 4.9: Central Florida Climate

Climate

The AZA requires that elephants have alternative heating if the outside temperature drops below forty degrees Fahrenheit. The CEC is ideally located in a part of the United States where the winters do not get that cold. A sanctuary in a warmer climate is more suited towards that elephant’s natural habitat, and will require less energy and resources. To be sure that the current center location has suitable winter conditions for elephants, a map is analyzed based on climate information from NOAA National Climatic Data Center (“Climate Information | National Centers for Environmental Information (NCEI) formerly known as National Climatic Data Center (NCDC),” 2016, “Winter Temperature Averages for Each USA State - Current Results,” 2016). The warmest state in the U.S. lower 48 is Florida, with winter temperatures averaging 50-55 degrees. Since this exceeds the minimum temperature of 40 degrees, the current location of the CEC in central Florida is very suitable.



Figure 4.10: Vegetation

Vegetation

The majority of the CEC property lies on wetlands, and about half is covered in natural wooded area. This area consists of deciduous, evergreen, and palm trees. The CEC grows crops like bamboo, banana trees, and elephant grass on site for treats for the elephants.

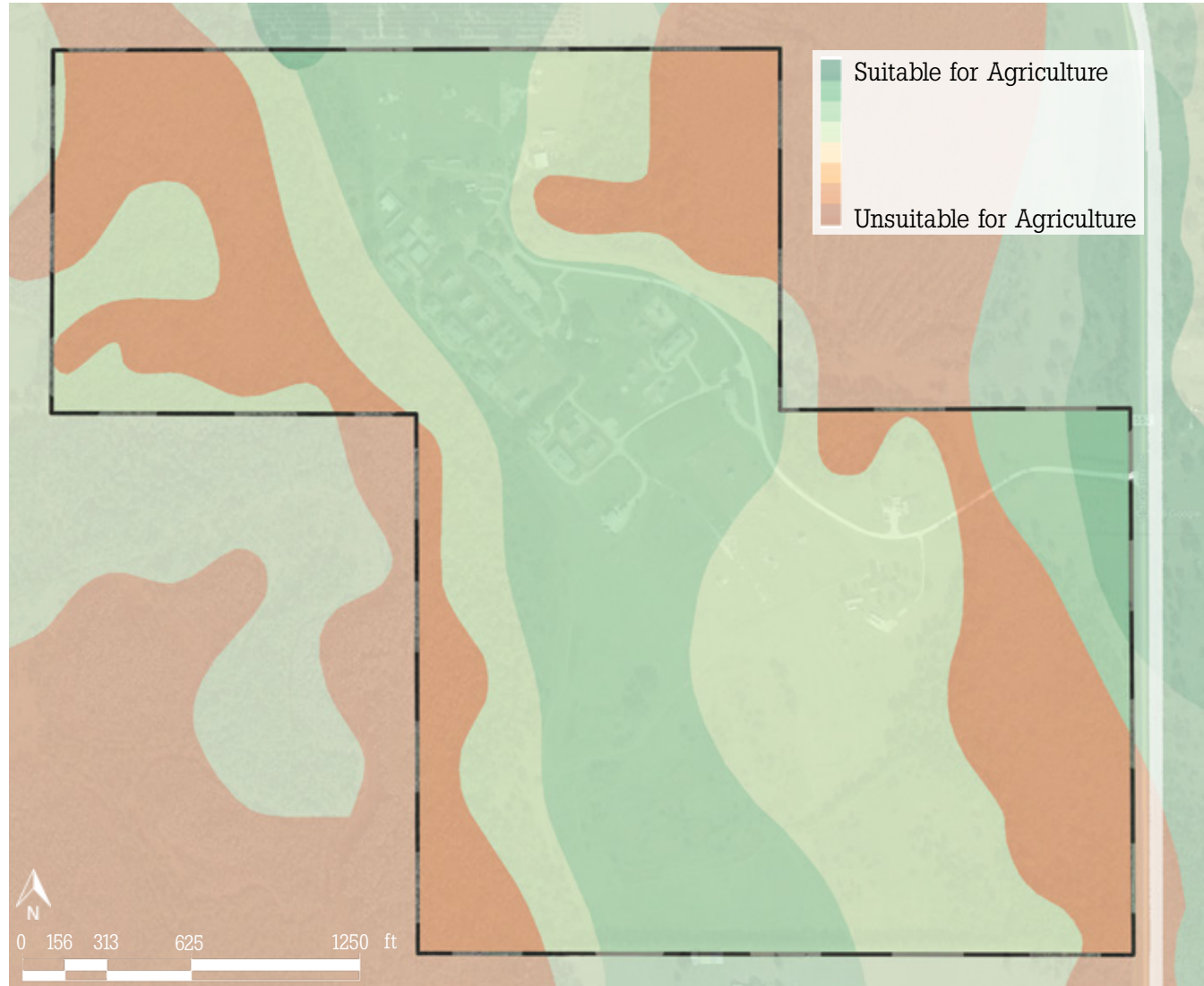


Figure 4.11: Soil Fertility

Soil Fertility

Through analysis of an agricultural capability class soil survey in ArcGIS, soil fertility levels are located. Locating fertile, farmable soil will allow the CEC to grow crops to feed elephants and use in guest meal preparation.. By growing crops that elephants can consume, a facility can reduce operation costs.



Figure 4.12: Topography

Topography

Topography on the site is relatively flat. The land varies twenty-five feet over the site's 200 acres. The existing CEC lies on the high point of the property, while the corners and edges are low lying wetlands.

CONTEXT

Regional Tourism

The Ringling Center for Elephant Conservation is conveniently located within a short driving distance of Orlando's thriving tourism attractions. Because of its required size, the center is located in a rural area. This makes travel more difficult for people who would like to visit. Since the center is located in a place where people already travel to, it would be more convenient to make a trip there. The Ringling Circus is attended by families, and the center will most likely also be a place for families. Many people write on the CEC's social media pages that they would like to bring their families to visit. The center will be convenient for tourists because it is located in a region that already has a large tourism industry, particularly for families. Many family vacations include amusement parks, like Disney World and Universal Studios. Both of these parks have locations in Florida, which happen to rank as one of the most popular states for tourism in the U.S. This makes the current location of the CEC ideal for tourists.



Figure 4. 13: Florida Context



Figure 4. 14: Surrounding Land Use / Access

Surrounding Land Use / Access

The surrounding land use of the CEC property on Polk County's website is categorized as "Agriculture/ Residential-Rural." The property is surrounded by crop and cattle farming, as well as a few residential houses. The CEC can be accessed by a two lane highway to the east.

SITE ANALYSIS SYNTHESIS









Item	Map	Opportunities & Constraints
 High Points: Driest parts of site that will drain well to lower points	Topography	Building and Structures
 Low Points: On wet parts of site, avoid enclosure placement or drain for elephant foot health	Topography	Pools and Drainage Areas
 Fertile Soil: Plantings will most likely flourish here	Soil Fertility	Agricultural Area for Growing Elephant Food
 Privacy Buffer: Needed on property lines for privacy from neighboring land uses	Surrounding Land Use	Trees, Vegetation or Walls
 Buffer: Needed to block unpleasant or distracting views, noises, or odors, and direct attention toward elephants	Noise and Odor	Trees, Vegetation, Walls
 Built Area: Existing state-of-the-art barns and enclosures should be preserved to maintain investment	Existing Facility	Preserve and Enhance
 Open Space: Opportunity for expanding exiting center	Existing Facility	Enclosures, paths, cabins
 Trees: Preserve trees in places where a buffer is needed	Vegetation	Preserve as Buffer

Table 4.1: Site Analysis Synthesis

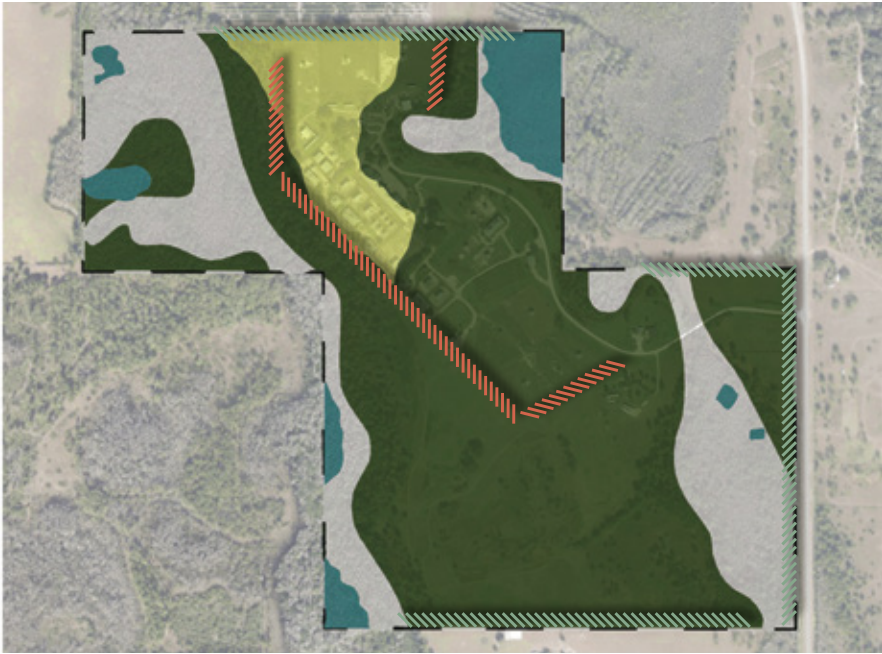


Figure 4.15: Opportunities and Constraints



Figure 4.16: Preservation and Enhancement Areas

THE ELEPHANTS OF THE ZAMBEZI RIVER VALLEY SEDGWICK COUNTY ZOO | WICHITA, KS

Date Visited: November 1st, 2016

Elephants of the Zambezi River Valley is the third largest elephant exhibit in the United States. The five acre site boasts the largest elephant pool in the world. The elephants in the exhibit were transported from Swaziland, which is reflected in the style and information presented in the exhibit.

Figure 4.17: Zambezi River Valley Habitat West



Figure 4.18: Zambezi Retaining Wall Enclosure



Figure 4.19: Zambezi River Valley Habitat East



Figure 4.20: Zambezi Views

EXHIBIT

Enclosure Techniques: The main barrier used in the exhibit is a series of strong vertical posts with horizontal wires stretching across. This barrier style is also used to create multiple elephant enclosures within the habitat. These barriers are not adjacent to walking paths. As elevation change plays a role in the exhibit design, retaining walls are also used in some areas running parallel to walking paths (Figure 4.6). Wide planters and decorative fencing keep walkers away from the edge of the wall. These retaining walls have a wire, possibly electric, attached about a foot higher than the top of the walls. The Elephant Boma has horizontal wires attached to vertical posts and a low wall to keep visitors from getting too close.

Sight Levels: Most of the observation area is elevated, so that the viewer is looking down upon the elephants (Figure 4.7). In the Elephant Boma, the viewer is at ground height, so it is possible to see how massive the elephant really is. As the visitor moves along the path away from the exhibit, docks protrude over the lake, with more distant views of the elephants. There are also towers that provide play and high views of the exhibit.

Views: A visitor may view the exhibit from half of the perimeter. In the center of the exhibit, a large round pavilion allows 360 degree views of elephants (Figure 4.8). In most scenes, a few trees scatter the foreground, an elephant in the midground, and decorative barriers and tree clusters in the background. Outside, visitors can see the elephant up close only if the elephant decides to wonder toward the barrier. Food bins are located on barrier retaining walls to encourage the elephants to do this. In the Elephant Boma, visitors can view elephants even closer if they happen to be occupying the space.

Routes: A visitor may walk about half the perimeter around the exhibit. In the center of the exhibit a path extends out to the focal point of the site, a large round pavilion that is surrounded by the elephant enclosures. A visitor may walk about half the perimeter around the exhibit. In the center of the exhibit a path extends out to a large round pavilion that is surrounded by the elephant enclosures.

Materiality: Materials throughout the exhibit mimic an old African style, associating these elephants with where they came from. Straw roofs, tribal symbols, weathered wood, “jungle” text fonts and earthy tones dominate the design. Most of the exhibit is designed to look slightly worn, as if it is an old African village (Figure 4.9).

Educational Signage: Educational signage is located along the paths and in the pavilion, explain who the elephants are, were they came from, and threats to elephants in the wild.(Figures 4. 11 and 4. 12).



Figure 4.21: Zambezi Fence



Figure 4.22: Zambezi Elephant Boma Sign



Figure 4.23: Zambezi Pond Lookout



Figure 4.24: Zambezi Education Sign



Figure 4.25 Zambezi Dust



Figure 4.26 Zambezi Tree Wires

HABITAT

Number of Elephants: The exhibit has seven elephants; one male and six females. They seem to have enough space to roam without getting in each other’s way

Acreage: 5 acres

Enrichment Activities: Natural materials and scratching posts are scattered around the habitat to encourage exploration. There are multiple food baskets on edges of the enclosure. Inside the Elephant Boma, there is hanging food that drops when it is meal time.

Materiality: The materiality of the habitat design is very naturalistic, expanding on the old African theme. The enclosures are composed of a grass field with dirt patches and sparse trees. Vertical wires, possibly electric, stick out of the ground in circles around the trees for their protection (Figure 4.5). Rocks, tree stumps, dust piles, and branch piles are scattered throughout the site (Figure 4.3).

Water Accessibility/Features: One large waterfall feature serves as a water source on one side of the habitat. A stream (Figure 4.4) flows from the waterfall, across the habitat, and into the world’s largest design elephant pool (Sedgwick County Zoo, 2016).

KEY FINDINGS FOR DESIGN

Enclosure Techniques	Enrichment Features	Materiality	Views
Post and cable	Dust and branch piles	Essence of native African culture	360 degree views
Retaining wall	Hanging food baskets	Natural materials	Food bin adjacency to path
Wire around trees	Scattered logs	Neutral colors	

KILIMANJARO SAFARI

ANIMAL KINGDOM, DISNEY WORLD | ORLANDO, FL

Date Visited: November 23rd, 2016

This simulated Africa safari shows off animals in their native habitats. Real trucks drive across what Disney has named the “Harambe Reserve.” Everything from the ride’s visitor entrance line before the ride to the costumes of the truck drivers portray a real safari atmosphere. The theme revolves around the issue of animal poaching.



Figure 4.13: Tree of Life

Figure 4.27: Elephant Exhibit Baboa Tree



Figure 4.28: Kilimanjaro Entrance



Figure 4.29: Kilimanjaro Truck Ride



Figure 4.30: Kilimanjaro Village Decor

VISITOR EXPERIENCE

Number of Visitors: 10 million per year

Educational Programs: The Kilimanjaro Safari ride offers a few fun facts about the animals in the exhibit, but does not go in depth about conservation. When speaking with Disney staff before visiting the park, they informed me that visitors could go to Rafiki’s Planet Watch for an in-depth educational experience. Here, there are videos, models, diagrams, and other information on real threats elephants experience in Africa and how Disney is helping.

Tour Information & Techniques: Before the ride, employees dressed as safari guides organize the visitor entrance line. During the ride, a narrator gives facts about the animals passing by and encourages riders to take photographs. The short train ride to Rafiki’s Planet Watch gives a behind the scenes tour of the Kilimanjaro Safari. This tour shows animal barns, additional enclosures, and feed preparation areas.

Accommodations: Outside the ride, a Moroccan style food court offers refreshments. Traditionally dressed African musicians play throughout common areas. Guests may stay at the Animal Kingdom lodge located right outside the park, where hoofed animals roam right outside the hotel balconies.

EXHIBIT

Enclosure Techniques: All enclosures in the exhibit are camouflaged to give visitors the impression that they are in an open field. While some animals do roam free, the exhibit uses level changes, moats, and disguised fencing to separate the vehicle from the more hazardous animals. Water-filled moats, electric wires, and steep elevation changes enclose the elephant habitat.

Sight Levels: Sight levels are dependent upon elevation changes. Some animals such as okapis are grazing on hills, while alligators and hippos soak in the water below.

Routes: The trucks all follow a consistent route but allow for variance to avoid an animal blocking the dirt road. This route consists of bridges, dirt roads, and even passes through water. The truck turns too let rider get good picture of the animals.

Views: The dirt path is designed for viewers to see animals out of the sides of the truck. The ride gives somewhat of a “show” for each species, framing multiple different views. Excitement grows when visitors spot an animal far ahead of the path, and the truck slowly approaches it. Some free-range animals like giraffes and rhinos walk close enough to the truck to touch.

Materiality: The materiality of the ride, lineup area, and surrounding features keep with the African Safari theme. Trucks carrying visitors are designed to resemble safari jeeps. African style signs warn of poachers. Decorative props, colorful paint, hut style roofs, and thick plantings reinforce the experience of being on a “real” safari.

Educational Signage: While waiting in line, visitors can spot signs with elephant facts. Televisions are mounted above the line, with videos informing people of poaching threats in the wild.



Figure 4.31: Kilimanjaro Retaining Wall Enclosure



Figure 4.32: Kilimanjaro Truck View



Figure 4.33: Kilimanjaro Signage



Figure 4.34: Kilimanjaro Poaching Sign



Figure 4.35: Kilimanjaro Framed Views

KEY FINDINGS FOR DESIGN

Enclosure Techniques

- Hidden ditches
- Camouflaged walls
- Electric wires
- Elevation change
- Moats

Tour Information & Techniques

- Safari experience
- Animal facts
- Current conservation efforts
- Behind the scenes tour

Materiality

- Essence of native African culture
- Natural materials
- Neutral colors

Accommodations

- Views of animals from balconies
- Direct park access
- Themed refreshments

TWO TAILS RANCH

WILLISTON, FL

Date Visited: January 5th, 2017

Two Tails Ranch is an elephant sanctuary that temporarily or permanently houses elephants in retirement, entertainment, and from zoos. The ranch is privately owned and operated. Elephants living permanently in the sanctuary were passed down through generations of the owning family.



Figure 4.36: Two Tails Feeding Station



Figure 4.37: Two Tails Luke Painting



Figure 4.38: Two Tails Snack Stand



Figure 4.39: Two Tails Elephant Rides

FINANCIAL

Operational Costs: \$90,000-\$120,000 per elephant per year

Income: Two tails ranch makes money from tours, elephant encounter experiences, off site events, donations, worldwide elephant management consulting, and temporarily housing elephants.

Funding Mechanisms: Two Tails is a tax-exempt nonprofit organization. Two Tails accepts monetary donations as well as cleaning products, farm equipment, food items, building materials, and labor.

Donations to Conservation: Two Tails aims to teach the proper care and management of elephants in captivity, and to instill awareness.

Costs to Build: Two tails current construction project is to fence twenty acres of the property to provide safe access to elephants for grazing. They estimate this cost to be \$75,000.

HABITAT

Number of Elephants: The ranch currently has eight elephants, but has had up to sixty-two during a hurricane in southern Florida.

Acreage: 67 acres

Enrichment Activities: Two Tails Ranch is a working farm. Elephants lift, push, pull and move heavy objects, acting as working farm animals. The owner of Two Tails Ranch says that every elephant has to have a purpose in life, a job, and a responsibility. The ranch owner also trains the elephants to respond to simple commands so that the elephants are well behaved and will move upon instruction. This can also be seen as a form of enrichment.

Materiality: Materials in the habitat consist of only things that are beneficial to elephants. The habitat was built for the well-being of the occupant rather than the visual appeal of the audience. Ground cover in the enclosure is simply dirt. Five heated barns are situated at the backs of the enclosures for elephants to enter and exit freely. Shade structures are constructed of metal beams and canvas (Figure 4.36). Street sweepers that act as scratchers are mounted to the shade structure (Figure 4.37). Metal vertical beams separate the multiple enclosures (Figure 4.38). Tires, tree stumps, and balls are available for play (Figure 4.39).

Water Accessibility/Features: No pools or water features are visible from the tour. However, the websites shows that there may be a couple of shallow pools for the elephants to wallow farther into the ranch.



Figure 4.40: Two Tails Mesh Shade



Figure 4.41: Two Tails Stool Scratching Post



Figure 4.42: Two Tails Bar Enclosure



Figure 4.43: Two Tails Stool Play Tires



Figure 4.44: Two Tails Female Enclosure

KEY FINDINGS FOR DESIGN

Enrichment Activities	Income	Operational Costs	Materiality
Working Farm Training	Entrance Additional Experiences	Elephant care per year	Tires, tree stumps and balls for play Simple beneficial materials in habitats

JAGUAR RESCUE CENTER

PUERTO VIEJO, COSTA RICA

Date Visited: January 19th, 2017

The Jaguar Rescue Center provides a temporary or permanent home to animals who have been injured or orphaned in the wild. The center takes in animals from the rainforest all over Costa Rica and the surrounding Caribbean region. The species at the center range from birds, small primates, amphibians, reptiles, and some small cat species.

Figure 4.45: Rescue Center Sloth



Figure 4.46: Rescue Center Sloth Kindergarten



Figure 4.47: Rescue Center Parakeet

VISITOR EXPERIENCE

Programming & Activities: The Jaguar Center hosts public tours twice per day, and private, more close-up tours once per day. The center also offers day and night tours at its La Ceiba Release Station. Volunteer programs are available as well for a minimum of one month.

Tour Information & Techniques: Tour groups of fifteen people are organized by language and taken to different starting points around the center. The tour is divided up by species. At each species enclosure, the tour guide discusses five topics: why the animal is here, issues the species has in the wild, issues the center had when the animal was rescued, how the center introduces the species to the wild, and how the center tracks the released animals to solve issues with reintroduction.

Accommodations: In addition to tours, guests can stay in one of two houses near the La Ceiba Release Station. Here, guests are surrounded by jungle and can see monkeys, birds, and sloths in their natural habitat. The main center has a café and gift shop for visitors.

KEY FINDINGS FOR DESIGN

Tour Information & Techniques

- Small tour groups
- Scheduled tour times
- Private tour options
- Topic structure

Accommodations

- On site overnight stay
- Natural wildlife surrounding houses
- Cafe for refreshments
- Gift shop



ELEPHANT NATURE PARK

CHIANG MAI, THAILAND

No Site Visit

Elephant Nature Park (ENP) provides a sanctuary for dozens of distressed elephants coming from all over Thailand, as well as rescued cats, dogs, buffaloes, and other species. This was the only precedent site that was not visited in person. The following information is found on ENP's website.

FINANCIAL

- Operational Costs:** Assumed operational costs include staff, elephant food, veterinarian services, property maintenance, and guest services.
- Income:** The park charges fees for several different trip options which include a combination of volunteering with animals, jungle hiking, rafting, and overnight stays.
- Funding Mechanisms:** ENP accepts donations through their partner charities. There is an opportunity to sponsor an animal at the park. There is also a wish list on the park's website of items they are in need of.
- Donations to Conservation:** ENP is partnered with the registered charity, Save Elephant Foundation, and a U.S. tax deductible charity, Serengati Foundation. ENP accepts donations and sponsors through these partner foundations.

VISITOR EXPERIENCE

- Programming & Activities:** The park offers several different trip options for experiences, however this analysis only focuses on the minimum day trip and overnight trip. This includes feeding and bathing elephants, and provided meals.
- Educational Programs:** Visitors learn hands-on care for elephants and are taught about conservation efforts in southeast Asia.
- Accommodations:** Meals are provided during the length of the trip. Guests stay overnight in one bedroom lodges.

KEY FINDINGS FOR DESIGN

Educational Programs	Income	Accommodations
Hands-on learning	Multiple trip options	On site overnight stay
Connection to local community	Trip Pricing	Local southeast Asia jungle style lodges
	Accommodation pricing	Included local meals

Figure 4.48: Elephant Nature Park

DESIGN GUIDELINES

Russel Ploutz's "New Cognitive Based Zoo Design Guidelines" were reviewed to gain a general understanding of how to design exhibits for learning. Ploutz studied the cognitive processes that humans use for learning, and uses this knowledge to create fifty-three guidelines with nine overarching principles for designing zoo exhibits for learning. The guidelines use seven example exhibit experiences designed to engage learning processes. Each example exhibit points out the use of the guidelines and how visitors are intaking information. Although the original purpose of these guidelines was to help visitors learn, many guidelines may also be used for other purposes in order to guide visitors within an exhibit. For this report, these guidelines were reviewed and analyzed with the design of an elephant conservation facility in mind. Informal notes were taken in order to recall this information during design development. These informal notes are referred to during the design process to make informed design decisions. In the next chapter, they are used as evidence, and assists in narrating the new CEC experience. The following is a summary of notes taken on Ploutz's guidelines (Ploutz, 2012).

There are several themes across all the principles and guidelines. Relating information and elements to people's past experiences and daily lives promote understanding and retention. Allowing visitors to make choices about their own experience helps them to discover on their own, gain intrinsic rewards, and create emotional attachment to the animals and issues presented. Principles of Ploutz's design guidelines (Ploutz, 2012) are summarized below.

Identity: The guidelines first explain five different identities, or purposes, exhibit visitors have. These identities act as filters through which visitors understand the exhibit. Each visitor identity requires different things in an exhibit in order to have a meaningful experience. These identities are used in the design chapter to influence how an exhibit is inclusive of all different types of visitors.

Attention: This principle presents strategies of obtaining, directing, and maintaining visitor attention. A powerful stimulus may be effective at grabbing initial attention or communicating a big message. Powerful attraction characteristics include size, isolation, color, or mufti-sensory objects. Spot lights, framed views, and sounds can act as focusing devices. Presenting smaller informational elements in a linear fashion may encourage guests to give equal attention to each element. Too many elements within a view or sight-line may overwhelm the visitor and distract from learning. Implied elements and questions may stimulate thought and make viewers attempt to understand the issue.

Inform: The inform principle discusses how to orient visitors to the exhibit, and how to inform them of the learning opportunities available.

Recall: Exhibits can use elements, questions, context, and unexpected features to make people associate the exhibit to their prior knowledge or experiences. Designs can play on the common experiences that humans share, such as driving, swimming, or eating.

Grasp: Visitors can understand information by linking abstract concepts and concrete examples. For example, an abstract diagram of an elephant's tusks could be located near a male Asian elephant exhibit. An interactive experience could lead to an emotional connection. An abstract concept may also be linked to an example that is already familiar to the visitor.

Guide: Exhibits should guide how visitors might think about information, make connections, and relate to existing knowledge and emotions.

Apply: To reinforce information, exhibits should provide feedback, and both extrinsic and intrinsic rewards to visitors. Exhibits should leave visitor in a positive emotional state so they can retain the information and associate it with a positive experience.

Transfer: When visitors apply learning after leaving the exhibit, they are contributing to conservation. To encourage visitors to transfer what they learned into other situations, problems and practices within the exhibit should be related to their daily lives. Encourage divergent thinking, where visitors can combine new information to make connections to previous knowledge.

COGNITIVE-BASED ZOO DESIGN GUIDELINES USED FOR PROJECTIVE DESIGN

Identity

- 1.1: Provide opportunities to create one's own challenging experiences.
- 1.2: Encourage interaction between groups of visitors.
- 1.3: Provide detailed information and insightful experiences.
- 1.4: Provide unique experiences with opportunities to remember the visit.
- 1.5: Create a beautiful place for relaxation and reflection.

Attention

- 2.1: Use a powerful stimulus to redirect one's attention to the learning content.
- 2.2: Set the intensity of a powerful stimulus to the audience.
- 2.3: Strategically design a powerful stimulus in the visitor experience.
- 2.5: Encourage visitors to use a sequential searching process.
- 2.6: Use devices to direct and focus attention.
- 2.7: Inform visitors of potentially distressing situations.
- 2.8: After evoking a negative emotion, end with a positive emotion.
- 2.9: Use cognitive-emotional arousal to focus our attention on learning.
- 2.10: Gain visitors attention with familiar animal.
- 2.11: Select animal species which communicate the learning content.
- 2.13: Regulate our attention by focusing our attention and minimizing distractions.

Inform

- 3.1: Inform visitors where to direct their attention for learning.
- 3.4: Inform visitors without compromising their choice and control.

Recall

- 4.1: Promote recall of common experiences to reach the broadest audience.
- 4.5: Stimulate recall using unexpected design elements.

Grasp

- 5.1: Contextualize abstract concepts by connecting it to a concrete experience.
- 5.2: Use familiar examples as concrete experiences to link abstract concepts.
- 5.3: Present abstract concepts as concretely feasible.
- 5.4: Create concrete experiences using personal experiences with physical engagement.
- 5.5: Engage visitors in concrete experiences causing an emotional reaction.

Guide

- 6.1: Connect the experience to existing knowledge.
- 6.2: Highlight connections between information in the exhibit.
- 6.3: Show how the information is useful.
- 6.4: Suggest how visitors might think about the experience.
- 6.5: Embed memories with positive emotions.

Apply

- 7.1: Encourage use to apply learning.
- 7.2: Maintain visitors' ability to interpret feedback.
- 7.3: Use intrinsic rewards for behavioral change.
- 7.4: Extrinsic rewards need to relate to the goals of the exhibit.
- 7.5: Cue recall of the information learned before and during the activity.
- 7.6: Evoke a positive emotional state during performance of learning.
- 7.8: Repeat concepts in new contexts.

Transfer

- 8.1: The information in exhibits need to relate to daily lives and experiences.
- 8.2: Connect learning experiences with prior learning outside of zoos.
- 8.4: Coordinate similar messages in multiple exhibits.
- 8.5: Assist visitors in making connections to other information.

KEY FINDINGS FOR DESIGN

Applicable guidelines are incorporated into the design of an elephant facility with the goal of promoting conservation. Information presented to the visitor according to these guidelines should relate to endangerment, poaching, human-elephant conflict, and breeding efforts.

FINANCIAL ANALYSIS

EXPERIENCE PRICING MODELS

A group of pricing models is collected in order to compare the prices of experiences at sanctuaries and other similar organizations (Table 4.2). Parks, zoos, and sanctuaries offering various activities are analyzed and inventoried by their price. Country, currency, park size, and packages are also taken into accounted and notably affect the cost of experience.

Pricing Model	Day Entrance	Additional Experience	Overnight Stay	Trainer for an Afternoon
Animal Kingdom	\$90 Park Entrance	\$189 Wild Africa Trek	\$400 (4 people) Animal Kingdom Lodge	\$90 Backstage Tales
Two Tails Ranch	\$20 Tour	\$5 Hand Feeding \$40 Elephant Ride		
Elephant Nature Park	\$73 Day Trip		\$168 2 days + 1 night	
Werribee Open Range Zoo	\$25 Day Entrance	\$55 Giraffe Feed Encounter	\$320 per Person Slumber Safari + 2 Day Park Entrance	\$87 Keeper for a Day
Ol Pejeta Conservancy	\$83 Day Entrance		\$10 Campsite \$50 per Person House	
Patara Elephant Farm				\$168 Elephant Owner for a Day
Discovery Cove		\$300 All Inclusive Entrance, Meals and Encounters		\$600 Dolphin Trainer for a Day + 14 Day Park Pass

Table 4.2: Experience Pricing Models

PROPOSED FINANCIAL MODEL FOR CEC

Due to the high operational cost of maintaining elephants in a ssanctuary setting, the CEC facility program (presented in greater detail in chapter 5) will be diversified to support several visitor experiences and revenue stresms. Based on the precedents, the following major income categories are proposed.

- Observational Visitation (trails, tours, training presentation)
- Participatory Visitation (elephant rides, elephant feeding, elephant training)
- Overnight Visitation (cabin stay, safari ride, recreation)

Although not included in this proposed project design, other revenue sources might include philanthropy, general donations, subsidies, and elephant research/conservation grants.

PROJECTED CEC FACILITY COSTS

An additional consideration for pricing are facility operation costs. Current costs include elephant care, maintenance, and staff. Cost of caring for elephants ranges between organizations, so the CEC's estimate will be used in this financial model. Because elephant care cost is known, it can be analyzed in order to be offset through visitor fees (below). Average salaries of employees needed are found through Glass Door (glassdoor.com). Number of employees are estimated according to the programming and size of the site. Costs may vary, however the model below is representative of available knowledge.

Cost of Facility Operations	Cost Per Year	Number	Cost
Elephant Care Supplies	\$65,000 per Elephant	50	\$3,250,000
Keeper Salary	\$40,000 per Keeper	8	\$320,000
Veterinarian Salary	\$90,000 per Veterinarian	3	\$270,000
Chef	\$40,000 per Chef	2	\$80,000
Housekeeper	\$20,000 per Housekeeper	6	\$120,000
Additional Staff	\$25,000 per Staff Member	10	\$250,000
Total Estimated Annual Cost: \$4,290,000			

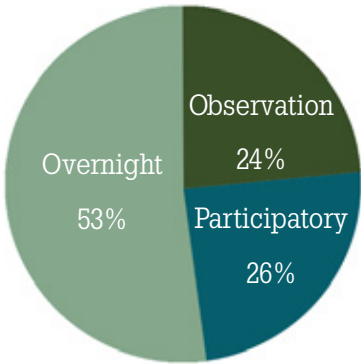
Table 4.3: Estimated Cost of Annual Facility Operations

POTENTIAL REVENUE RANGE BASED ON MODELS

An estimation of pricing options and attendance based on pricing models is used to determine a range of revenue achievable for the CEC. Attendance is estimated according to comfort for the elephants as well as attendance informally witnessed during precedent study visits. Table 4.4 shows that it is possible for the new CEC to achieve a daily gross revenue of \$31,195. However, pricing is adjusted according to the final site plan and experience programming. Package options from models must be taken into consideration and new package options for the CEC must be designed. Final prices for the CEC will most likely be an average of the price ranges found during model inventory. Therefore, total revenue will be an average of the estimated revenue below, around \$18,500. Potential profit below is based on estimated annual revenue and estimated annual costs. Potential profit will be offset by cost of new construction and additional maintenance costs.

Activity	Price Range per Person	Estimated Attendance	Estimated Revenue	Average Percent of Revenue
Day Visit (observation)	\$20-90	75	\$1,500-\$6,750	24%
Additional Experiences (participatory)	\$5-\$300	(Limited to Hand Feeding and Elephant Ride)		26%
Hand Feeding	\$5	25 (Two Tails Attendance)	\$125	
Elephant Ride	\$40	10 (Two Tails Attendance)	\$400	
Trainer for an Afternoon	\$87-\$600	10	\$870-\$6000	
Overnight Stay	\$50-\$320	56 (80%) max capacity	\$2,800-\$17,920	53%

Total Daily Revenue Range: \$5,695-\$31,195
Average Estimated Daily Revenue: \$18,500
Average Estimated Annual Revenue: \$6,752,500
Total Estimated Annual Cost: (\$4,290,000)
Estimated Potential Profit: \$2,462,500



KEY FINDINGS FOR DESIGN

Although a specific cost estimate of construction for the new CEC is not a part of this report, it is informally taken into consideration when pricing experiences. It is noted that the cost of operations will also increase. More staff will be hired to accommodate guests. New positions will include supervisors, housekeepers, chefs, and entrance staff. The number of visitors must somewhat be limited in order to ensure the comfort of the elephants, as well as keeping a solitary interactive experience. Providing guests with a unique, individual experience increases overnight prices, therefore limiting the demographics of those who are able to afford an exclusive experience. A day trip option is necessary to increase revenue and accommodate a larger pool of potential visitors. While the day trip is both informative and unique, it is be more restrictive and include more guests. The overnight stay will be advertised as an exclusive, personal experience at the CEC, while the day trip is a more affordable option available to everyone. The goal of welcoming visitors on site is to alleviate the CEC's costs of operations. However, it may not be possible to fully support operational costs through paying visitors alone. Allowing visitations, however, will increase public awareness of elephant conservation. In addition, this first initiative of educating visitors may spark increased donations to elephant conservation efforts.



Figure 4.49: Baby Elephant Playing at the CEC (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)

Table 4.4: Potential Revenue Range

CHAPTER 5 *DESIGN*



Figure 5.1: Elephant Education Trek Seating Overlook

PROJECT GOALS

1 PROVIDE AMENITIES TO ATTRACT TOURISTS INTERESTED IN WILDLIFE

- Cabins for visitors to stay on site for retreat
- Individual outdoor areas for elephant viewing
- Recreation opportunities

2 CREATE OPPORTUNITIES FOR UNIQUE, CLOSE UP VISITOR EXPERIENCES AND INTERACTIONS

- Creative barriers
- Directed views
- Interactive experiences
- Place for visitors to prepare food and feed elephants
- Water feature/pond for visitors to bath elephants
- Paths for trekking through the site that promote guest choice

3 PROMOTE ELEPHANT CONSERVATION THROUGH EDUCATION AND FUNDRAISING

- Space for research
- Information sessions on conservation issues
- Educational features for guests

Vision: The new Ringling Center for Elephant Conservation will be an oasis for both visitors and elephants. Trails, panoramic views, and interactive elements all centered around the Ringling elephants will contribute to create a unique, personalized experience for guests. The new site will function as a park, providing recreation, relaxation, and education for guests. The big idea across the site is educating visitors to conservation needs related to the Asian elephant and its natural habitat. The programs and activities will also be an opportunity to promote the mission of the Ringling CEC.

4 REFLECT THE CONSERVATION EFFORTS OF THE CEC AND THE ASIAN ELEPHANT'S NATURAL HABITAT

- Materiality and design features
- Presentation space to educate visitors on the history of elephants in the Ringling Circus

5 MAINTAIN THE HEALTH OF ELEPHANT RESIDENTS

- Enrichment activities
- Food preparation space
- Veterinary care space
- Water access
- Shade
- Grooming spaces
- Sleeping spaces

6 PROVIDE SAFETY FOR VISITORS, WORKERS, AND ELEPHANTS

- Maintain current elephant holdings
- Barriers
- Security systems

Figure 5.2: Three CEC Elephants (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)

SUMMARY OF PROGRAM

To achieve a design program that balances visitor needs, elephant health, and financial success the following elements are proposed:

New Entrance

Visitor Entrance Road (2,150 Linear Feet)

Parking Lot (241,000 Square Feet): Parking for about 300 employees and guests

Entrance Lodge (16,300 Square Feet)

Front Desk: Guests check-in, buy tickets, and receive tour information.

Cafe: Guests may stop and purchase refreshments

Gift Shop: Guests may buy a souvenir, of which profits are contributed to conservation efforts

Kitchen: Meals are prepared for cafe and overnight guests (delivered)

Administration Offices: Work space for finance, marketing, planning employees

Enclosures: Provide new roaming and grazing space for the elephants. Multiple enclosures are provided for appropriate elephant social groups to rotate between barns and enclosures.

Elephant Education (15.6 Acres)

Safari Lands Enclosure (57.5 Acres)

Ringling Elephant Enclosure (23.1 Acres)

Training Center (13.7 Acres)

Visitor Trails (14,400 Linear Feet): Offers opportunities to view and learn about elephants.

Water (5.1 Acres): Pools for elephants to wade and bath, recreation for guests (with safety separation).

Edible Crops (14.6 Acres): Provides supplemental food grown on site for elephants and kitchen.

Safari Lands

Safari Road (5,850 Linear Feet): Guests are taken on a short elephant safari before reaching their cabins.

Safari Trek Trails (6,300 Linear Feet): Guests who stay overnight have access to additional secure trails for elephant viewing and recreation.

Cabins (10,000 Square Feet)

6 One Bedroom Cabins: Accommodates a group of four

6 Two Bedroom Cabins: Accommodates a group of six

1 Deluxe Lodge: Accommodates a group of 10 people who seek of an extremely exclusive experience that serves as a donation to conservation efforts.

CONCEPTUAL DESIGN PROCESS

CRITERIA FOR DESIGN EVALUATION

Alternative site designs were produced and evaluated throughout the design process. Two sets of evaluation were done, one evaluating programmatic elements used and one evaluating the different design alternatives. Both evaluations were measured by impact on four criteria: private visitor (day trip), public visitor (overnight stay), elephants, and the land. Each feature received a ranking one through five, one having a negative impact on the criteria and five having a positive impact on the criteria (Table 5.1).

The first evaluation was done to assign programming. The impact of appropriate design elements were evaluated to discover how, where, and how often they should each be used. These elements were organized and ranked in a single table. Table 5.3 shows the elements evaluated and their ranking in each criterion. A total score for each element is listed, and used to make decisions regarding programming.

The second evaluation was done to compare design alternatives against one another based on their design features. These design features are listed in Table 5.1. A complete table was made for each design alternative shown in Figure 5.2. Scores were totaled in the same way as the program feature evaluation, and these design feature scores were used to inform the next design alternatives. This evaluation process was done until the final design was decided upon.

Ranking	Effect
1	Very negative
2	Negative
3	Neutral
4	Positive
5	Very Positive

Table 5.1: Evaluation Ranking on Feature Impact

Design Feature Per Design

Circulation

Function

Views

Choice

Scale of Elements

Hierarchy of Spaces

Experience

Visceral

Educational

Infrastructure Cost

Identity Fulfillment

Explore

Facilitate

Professional

Experience Seeker

Recharge

Table 5.2: Design Alternative Evaluation Lists of Design Features

PROGRAM FEATURE EVALUATION

Program Feature	Private Visitor	Public Visitor	Elephant	Land	Total Score
Per Element					
Pond	5	5	5	1	16
Buildings	5	2	3	1	11
Barriers					
Retaining Wall	4	4	3	1	12
Glass	5	5	2	3	15
Beam-Cable	2	2	3	3	10
Pool	5	5	2	1	13
Bars	1	1	3	3	8
Ditch	5	5	2	2	14
Gate	1	1	3	3	8
Wires	2	2	1	3	8
Concrete	3	3	3	3	12
Shade					
Trees	4	4	5	5	18
Canvas	5	5	5	3	18
Solid	5	5	5	2	17
Visual Barriers					
Natural	5	5	5	5	20
Architectural	5	5	4	3	17
Hybrid	5	5	5	4	19
Overlook	5	5	3	2	15
Water Recreation	5	5	2	3	15
Intensity of Use					
3 hours per day	2	4	3	4	13
Thursday-Sunday	1	5	2	3	11
Weekends	2	4	3	4	13

Table 5.3: Program Feature Evaluation

DESIGN ALTERNATIVES

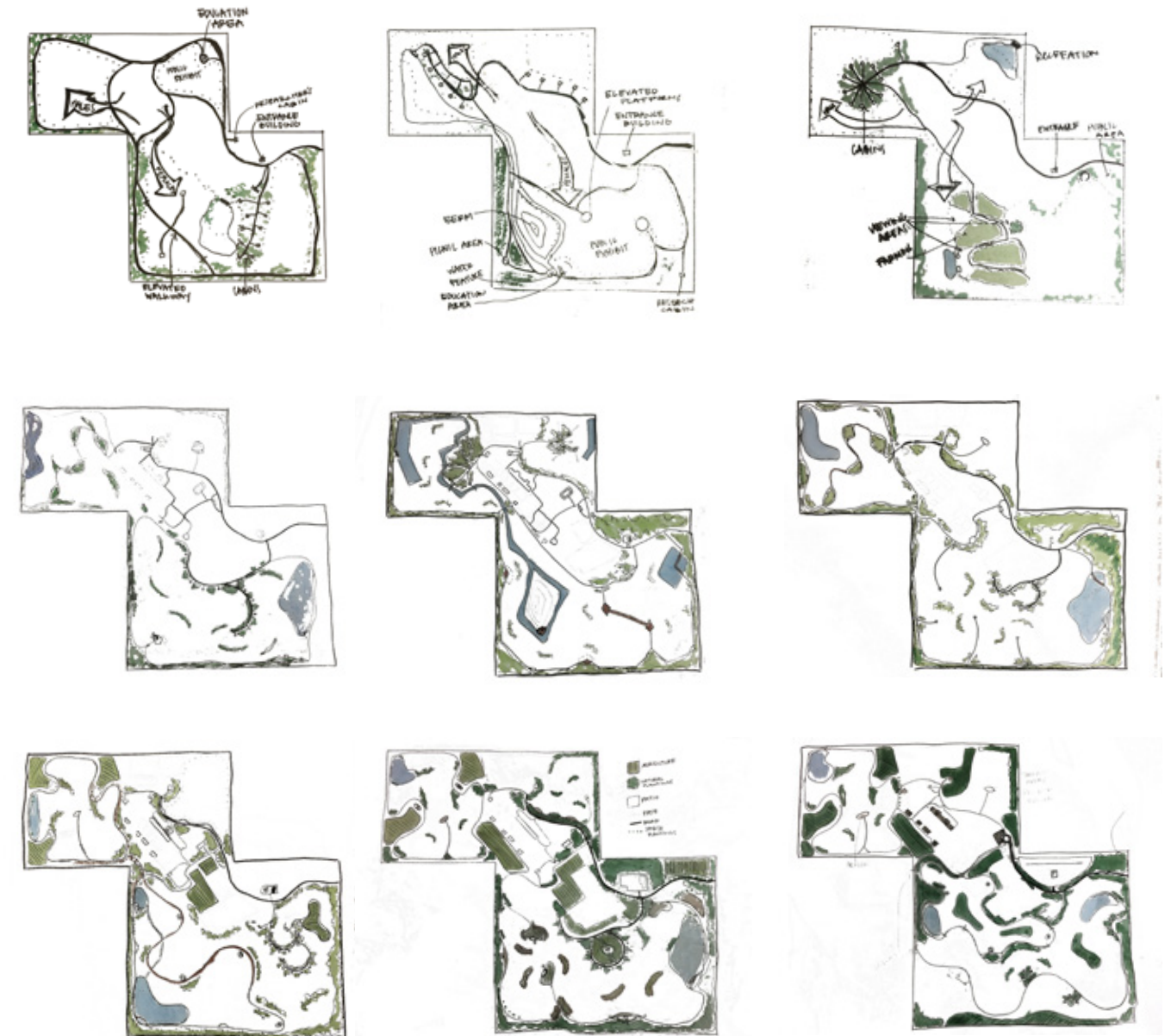


Figure 5.3: Design Alternatives

PROPOSED DESIGN

BIG MOVES

- 1 The site is organized by six visitor experiences in order to separate uses by function. (p 60)
- 2 The central area of the site containing barns and enclosures is currently state-of-the-art, and is preserved in order to maintain the investment already made. The outside of these facilities may be enhanced and retrofitted to match the style of the new CEC. (p 86)
- 3 A new entrance, parking lot, and amenities building accommodates tourism. (p 72)
- 4 The southern part of the site is reserved for the exclusive use of guests who book overnight stays. (p 88)
- 5 The open space on the northeast, northwest, and southern parts of the site are designated for the construction of three large elephant grassland enclosures. Elephants are rotated between these grassland enclosures and the existing pens based on need and social group. (p 74, 90, 84)
- 6 Each of the three new enclosures is a mixture of trails, education elements, enrichment features, and plantings that support one theme. (p 74, 90, 84)
- 7 Features involving the interaction between elephants and visitors are placed at intervals around the site to create unique experiences. (p 66)
- 8 Pools are placed in each new enclosure, located at lowest elevations, and drain water from rest of site for elephant safety. Low lands are graded to drain to pools.
- 9 Enclosures contain visual barriers in the form of planting and architectural elements for elephants to hide themselves from aggressors.



Figure 5.4: Site Plan

EXPERIENCE OVERVIEW



Figure 5.5: Experience Overview

The proposed site design is organized by a series of experiences offered to visitors. Each experience serves a different purpose and caters to different visitor interests. The design features of each experience promote its specific purpose. The following is a brief overview of what visitors can expect in each experience.

ENTRANCE

The entrance is the first look at the CEC. After a brief sighting of grazing elephants, guests park their vehicles and walk to the entrance lodge, where they can purchase tickets. The entrance lodge contains the welcome desk, cafe, gift shop, kitchen, offices, and service areas. (More on page 102)

TRAINING CENTER

In the tertiary exhibit, guests can walk out to the patio for more 360 degree views of the elephants. Presentations educating guests on training techniques and elephant care occur under the pavilion. Guests can also make appointments to be a trainer for an afternoon, ride an elephant and hand feed an elephant, that occur in this exhibit. (More on page 114)

ELEPHANT EDUCATION TREK

The first trek consists of a winding pathway with panoramic views and varying terrain. Along the pathway guests will encounter education stops where they learn about elephants in the wild and in captivity. (More on page 104)

CARE CENTER

The existing facility of the CEC is maintained, but retrofitted to support its new purpose. Guests will be guided through the center by a CEC employee, and have the opportunity to get a “behind the scenes” look at the food prep, veterinarian care, and research that the CEC does every day. (More on page 116)

RINGLING ELEPHANT TREK

The second trek features information about conservation efforts specific to Ringling and the CEC. Guests will have diverse viewing and interaction opportunities of the elephants and get a glimpse of how Ringling is working to protect the species. (More on page 110)

SAFARI LANDS

Guests who would like an extremely unique and extended stay have the option to stay in an elevated cabin on the CEC’s Safari Lands. Guests will wake up to views of elephants grazing right in their front yard. Guests staying in the Safari Lands have exclusive access to safari truck rides, the Safari Trek, the Watering Hole, and recreation. Recreational activities exclusive to the Safari Lands are biking, kayaking, and stand up paddle boarding. (More on page 118)

VISITOR OPTIONS

Prices at the CEC are based on the analysis of precedent facilities, as well as the uniqueness of the CEC's experiential design. A variety of activities allow guests to personalize their experience according to their interests and budget. Price points for each experience is targeted toward specific demographics. Each price ensures that activities at the CEC are reserved for visitors who are extremely interested in the experience, but is still available for a variety budgets. Times of activities establish adequate visitation periods without causing stress of the elephants.

ACTIVITY	TIMES	PRICE
Day Visit.....	11:00-3:00	\$75 per person
Includes:		
Elephant Trek.....	All Day	
Educational Presentation.....	11:00, 12:00, 1:00, & 2:00	
Behind the Scenes Tour.....	11:00, 12:00, 1:00, & 2:00	
Lunch.....	12:00 pm	
Additional Experiences		
Trainer for a Day.....	3.5 Hours, By Appointment...	\$50
Feeding.....	All Day.....	\$5
Ride.....	20 Minutes, By Appointment.	\$40
Packaged Trainer & Ride.....	4 Hours, By Appointment.....	\$80
Overnight Stay.....		
Check In 4:00/ Check Out 11:00		
Deluxe Lodge.....		\$2500 per night
2 Bedroom Cabin.....		\$650 per night
1 Bedroom Cabin.....		\$450 per night
Includes:		
Elephant Trek.....	All Day	
Educational Presentation.....	11:00, 12:00, 1:00, & 2:00	
Behind the Scenes Tour.....	11:00, 12:00, 1:00, & 2:00	
Recreational Opportunities.....	All Day	
3 Meals.....	6:00 pm. 7:00 am, 12:00 pm	

VISITOR PROFILES



ELDERLY COUPLE



COLLEGE STUDENT

Motivations:

The elderly couple retired to Florida a year ago and has been exploring different attractions in Florida during their free time. They really enjoyed seeing the Ringling Circus when the elephants were still performing, so visiting the CEC has been on their wish list. Staying at the CEC will give them time to relax. They will spend two nights at the CEC. They both fulfill the role of rechargers (Ploutz 1.5).

Experience Chosen:

- 2 Night Stay

Activities Chosen:

- Day 1: Safari Ride, Safari Trek to Watering Hole
- Day 2: Elephant Education Trek, Care Training Presentation
- Day 3: Overlook, Behind the Scenes Tour

Motivations:

The student is on break from college and is road tripping through Florida. She is studying park management and conservation and is interested in working with elephant conservation, so she decides to make a detour to the CEC between staying in Orlando and visiting friends in Fort Lauderdale. She is on a budget so chooses the cheaper experiences. She is interested in learning about elephants and conservation, therefore she fulfills the role of a professional (Ploutz 2.3).

Experience Chosen:

- Day Trip
- Hand Feeding

Activities Chosen:

- Day 1: Elephant Education Trek, Behind the Scenes Tour, Care Training Presentation, Hand Feeding, Ringling Elephant Trek



FAMILY WITH YOUNG CHILDREN

Motivations:

The family is on vacation in Florida. They spent a few days at the Gulf Coast beaches and now driving to Disneyworld. The family will spend two days and are one night at the Center for Elephant Conservation. The parents believe visiting the CEC will be a great experience for their children to learn about elephants, and the children are very excited to see them. The parents fulfill the role of facilitators (Ploutz 1.2) and the children are explorers (Ploutz 1.1).

Experience Chosen:

- 1 Night Stay
- Trainer for a Day + Ride Package
- Feeding

Activities Chosen

- Day 1: Elephant Education Trek, Safari Ride, Safari Trek
- Day 2: Paddle boarding, Trainer+ Ride, Feeding, Care Training Performance, Behind the Scenes Tour, Ringling Elephant Trek



YOUNG ACTIVE COUPLE

Motivations:

This couple in their late twenties are visiting family in Orlando, and want to make a vacation out of the trip. They are passionate about traveling and wildlife conservation and want to learn more about the Ringling organization. They have decided to stay at the CEC for a couple of nights in seek of a unique new experience that they can add to their collection of travels (Ploutz 1.4).

Experience Chosen:

- 2 Night Stay
- Feeding
- Ride

Activities Chosen:

- Day 1: Safari Ride, Safari Trek
- Day 2: Kayaking, Elephant Education Trek, Care Training Presentation, Feeding, Ride, Behind the Scenes Tour
- Day 3: Ringling Elephant Trek



Figure 5.6: Aerial View of Proposed Site Design

CIRCULATION

Four path types are determined by functional and experiential needs. The materiality and width of the paths are based on the intensity of use. The visitor entrance road and trek path are made of more durable materials because they will be used by all visitors. The Safari Road and Safari Trails are made of loose gravel because they will only be used by overnight guests.

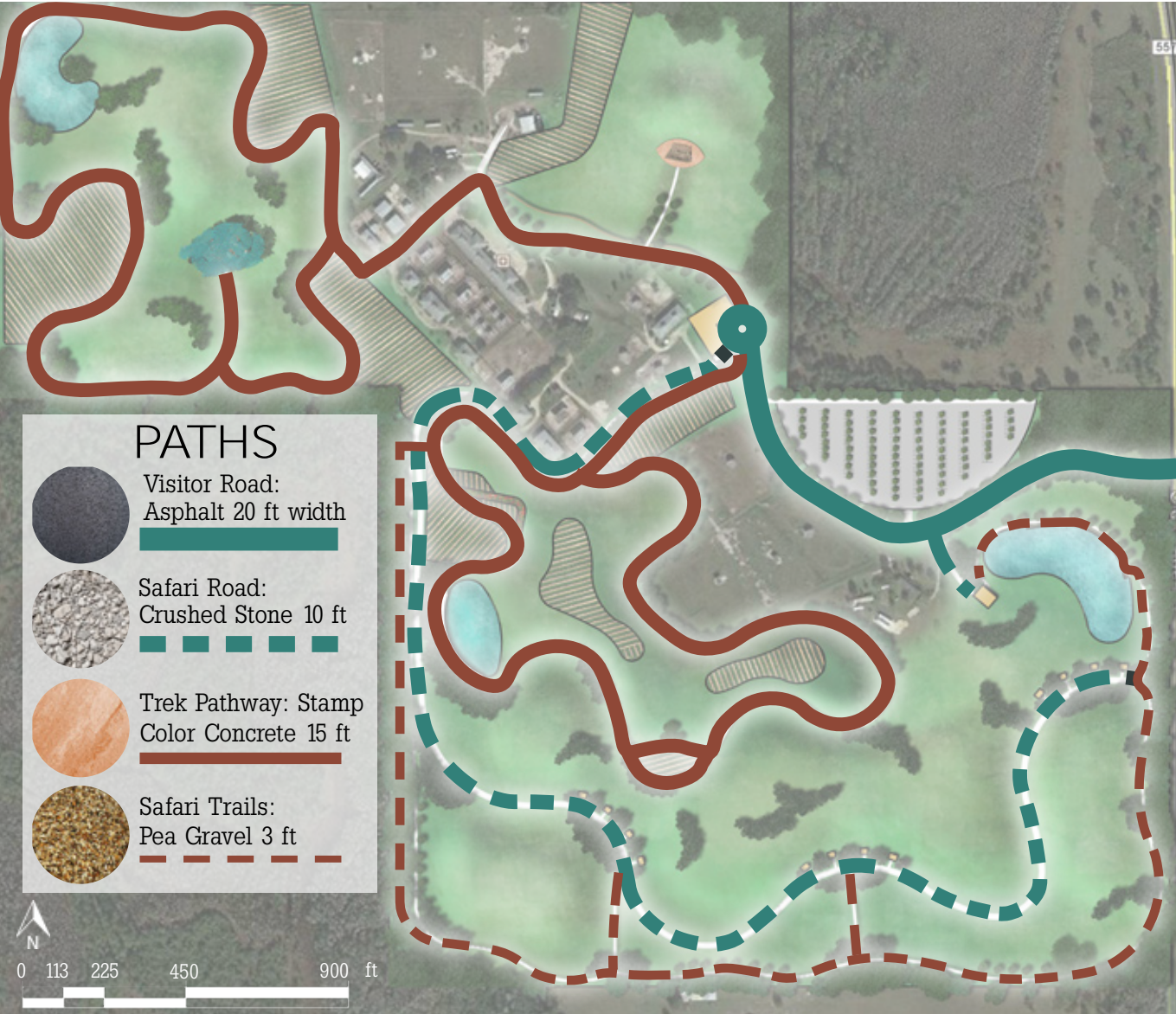


Figure 5.7: Circulation

ACCESS

Access restrictions are dependent on the assigned uses of each space described on page 87. General guests visiting for the day will be able to access everything except the Safari Lands, which is exclusive to overnight guests. In certain areas, guests must be accompanied by employees. The areas within the enclosures are off limits to guests due to safety reasons, and are accessible only to employees.

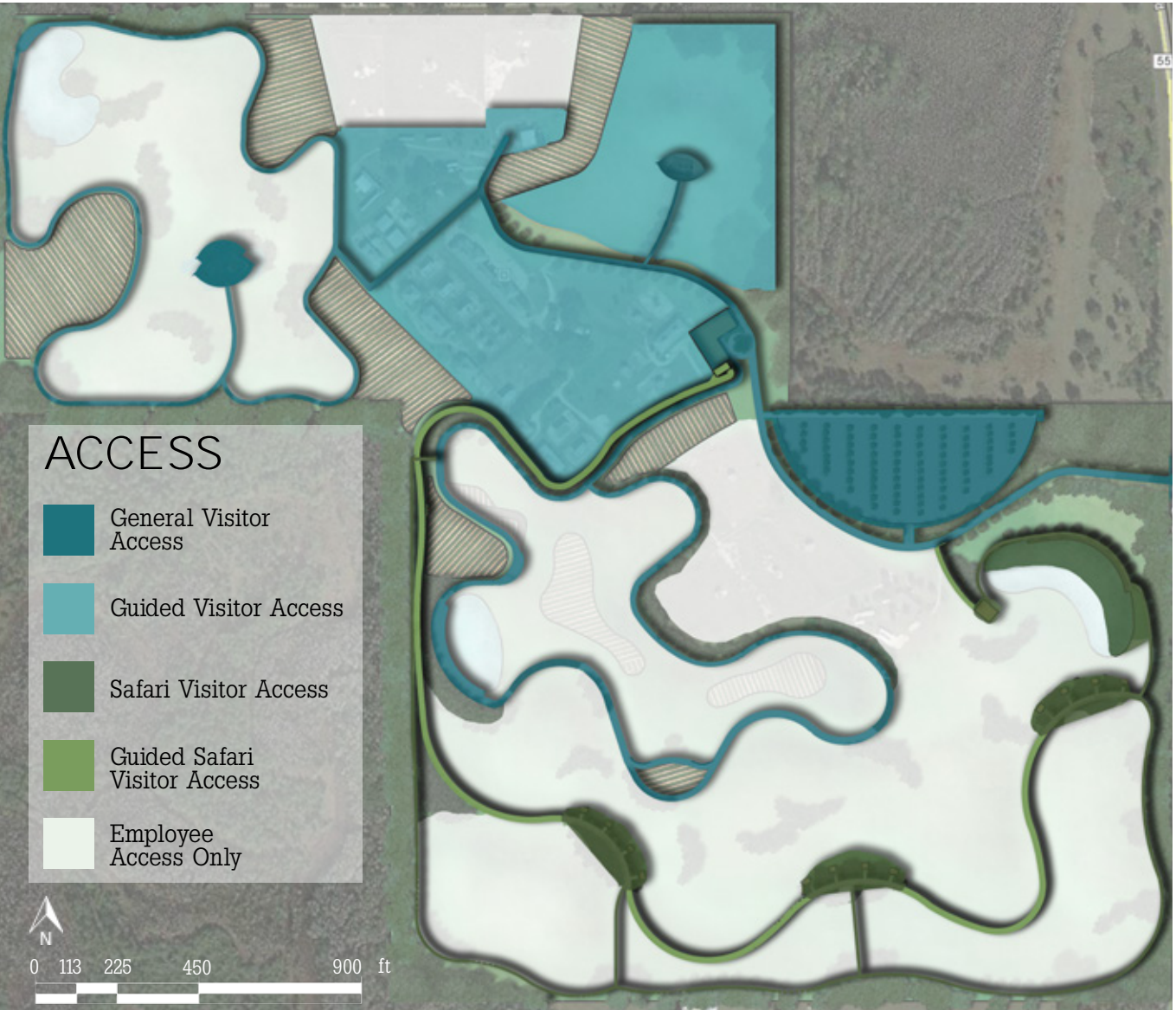


Figure 5.8: Access

TRAIL INTERACTION

Along the treks, visitors will encounter interaction areas. These areas are designed for up-close viewing and hands-on learning. Interaction areas consist of overlapping or similar elements inside and outside of the elephant enclosure. Suggestions for placement are shown on the map below. Examples of what these interaction areas might look like are shown on the next page.



Figure 5.9: Additional Trail Interaction



Figure 5.10: **Tire Play Interaction:** Similar downsized features allow guests to experience the same elements that the elephant experiences.

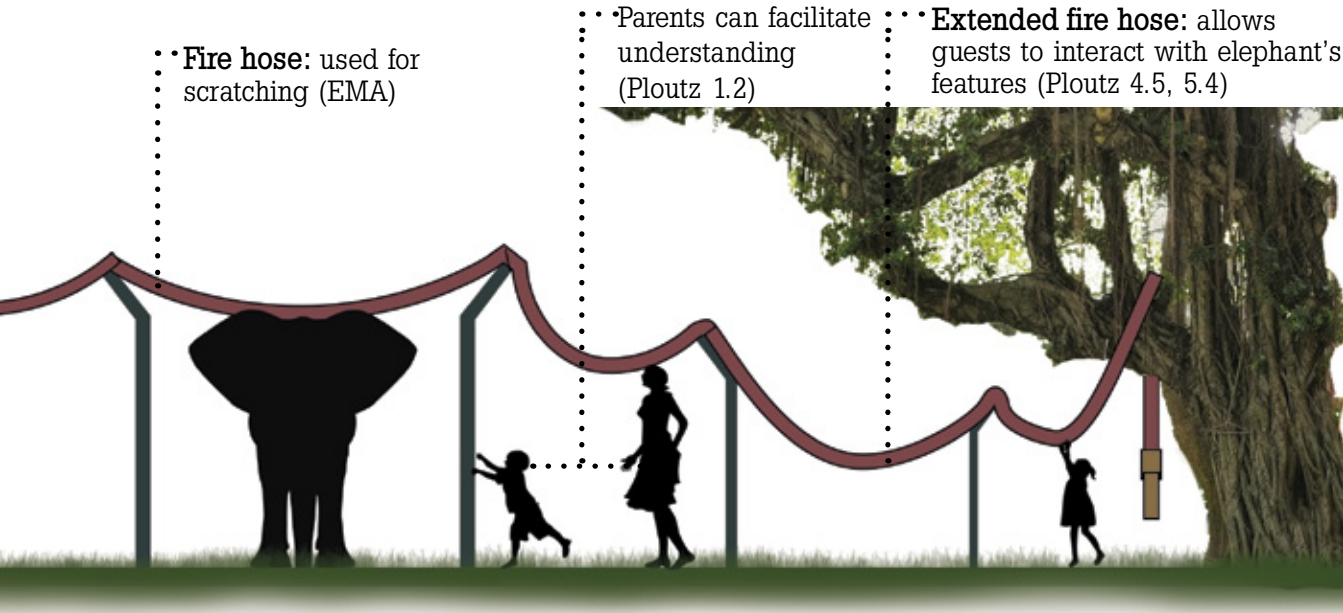


Figure 5.11: **Scratching Hose Interaction:** Elements overlapping both sides of the enclosure allow guests to experience the same elements that the elephant experiences.

BARRIERS

Barriers had a major influence on the proposed design. Each barrier type accomplishes different objectives. Types of barriers were inventoried and applied to appropriate boundaries of enclosures. In addition to the barriers listed, wire barriers are placed around vegetation in enclosures.

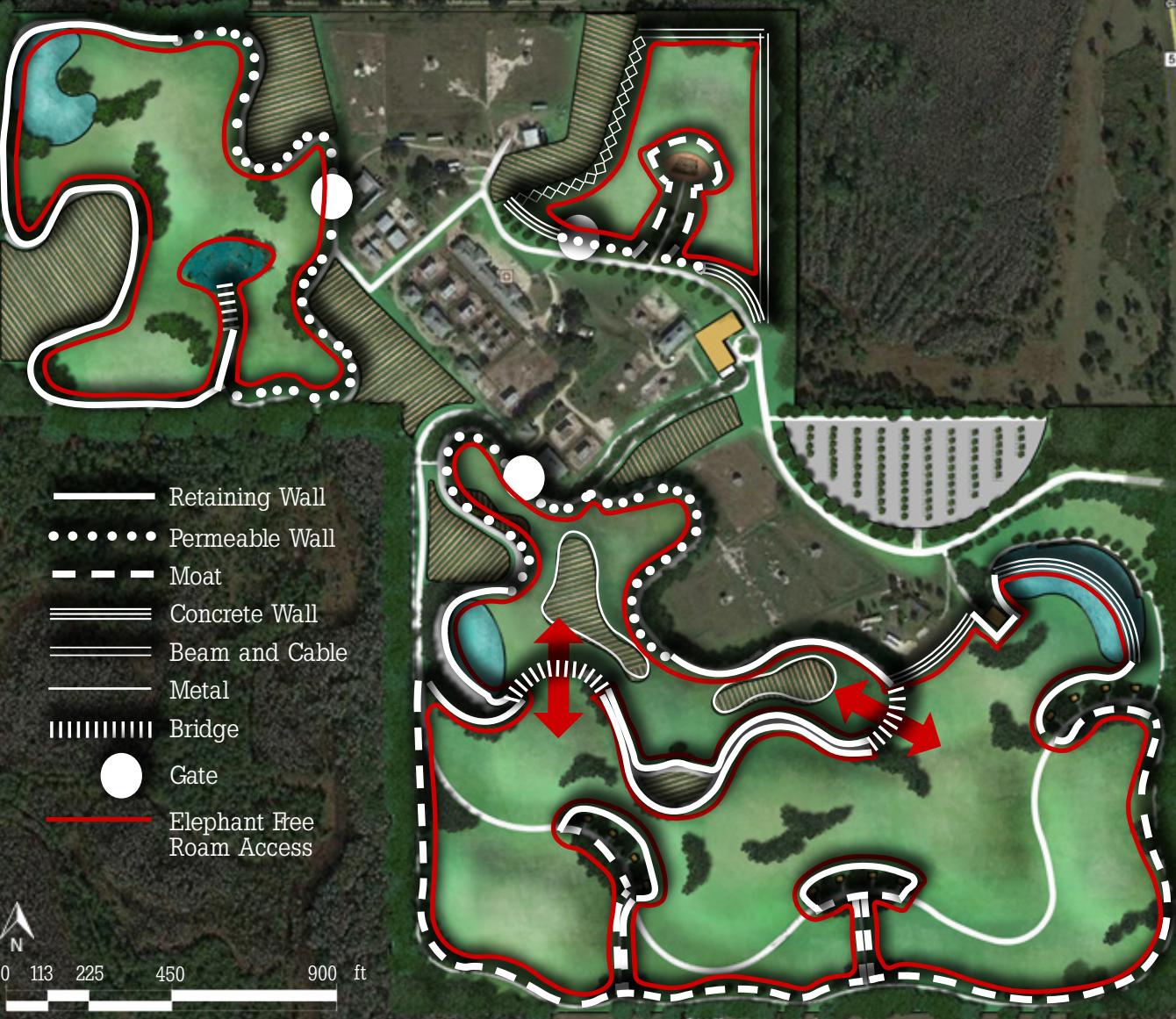
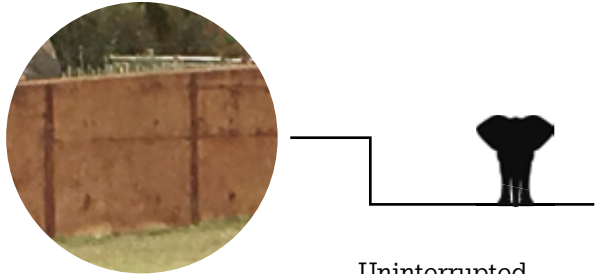
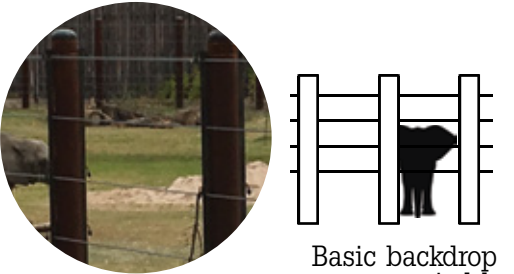


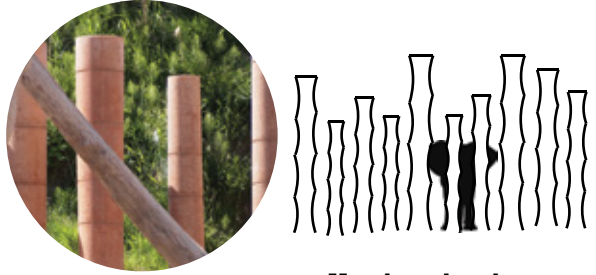
Figure 5.12: Barriers



Retaining Wall: Uninterrupted panoramic views



Post and Cable: Basic backdrop accompanied by vegetation



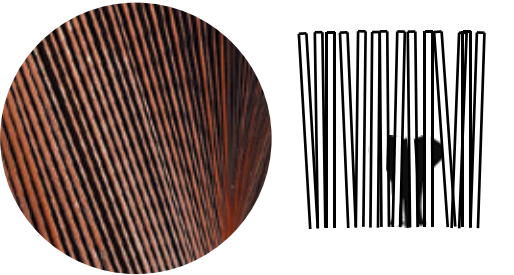
Permeable Wall: Up-close level viewing areas



Bridge: Crossing of visitor and elephant paths



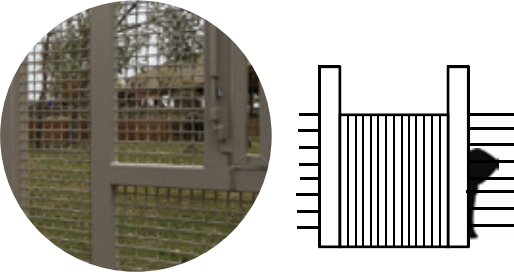
Moat: Uninterrupted panoramic views



Metal: Decorative boundary around crops



Concrete: Hidden enclosure or backdrop



Gate: Enclosure Access

Figure 5.13: Barrier Types

FEEDING AND ENRICHMENT

The elephant's feeding schedule is the same as the existing CEC. However, food will be strategically placed throughout the site adjacent to visitor paths to provide enrichment for elephants and close-up viewing for guests. Sand and branch piles are also placed throughout the site to encourage natural elephant behavior.



Figure 5.14: Feeding and Enrichment

VEGETATION THEMES

General vegetation themes are developed to establish the materiality and feel of the proposed design. Plants native to the southeast Asian jungles ignite connections between the elephants and their natural habitat. Edible plants can be harvested and supplement a part of the elephants diet so that less food is purchased. Florida specimen tropical plants are placed to add to the vacation atmosphere. Edible plants are planted in designated crop areas, and a mixture of Florida and Asia plants provide visual barriers, shade, and privacy. Examples of plants in each category are shown below.

SOUTHEAST ASIA JUNGLE



Bromelads



Banyan Tree



Bougainvillea



Chinese Fan Palm

EDIBLE FRUITS, GRASSES, AND BRUSH



Elephant Grass



Apple Trees



Bamboo



Date Palm



Banana Trees

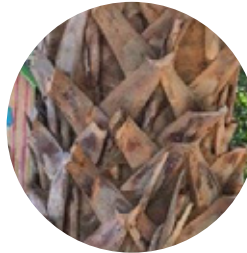
FLORIDA SPECIMENS



Sabal Palm



Bird of Paradise



Various Palms



Live Oak

Figure 5.15: Vegetation Themes

ENTRANCE

A new entrance welcomes and prepares visitors for their visit to the CEC. Brief views into the elephant enclosure increases excitement and participation as guests park their vehicles and walk to the entrance lodge. Here, they will purchase tickets and other necessary amenities. The entrance lodge contains the welcome desk, cafe, gift shop, kitchen, offices, and service areas.

Hours: 11:00am-3:00pm Public Day Visit

Price: \$75 Day Visit

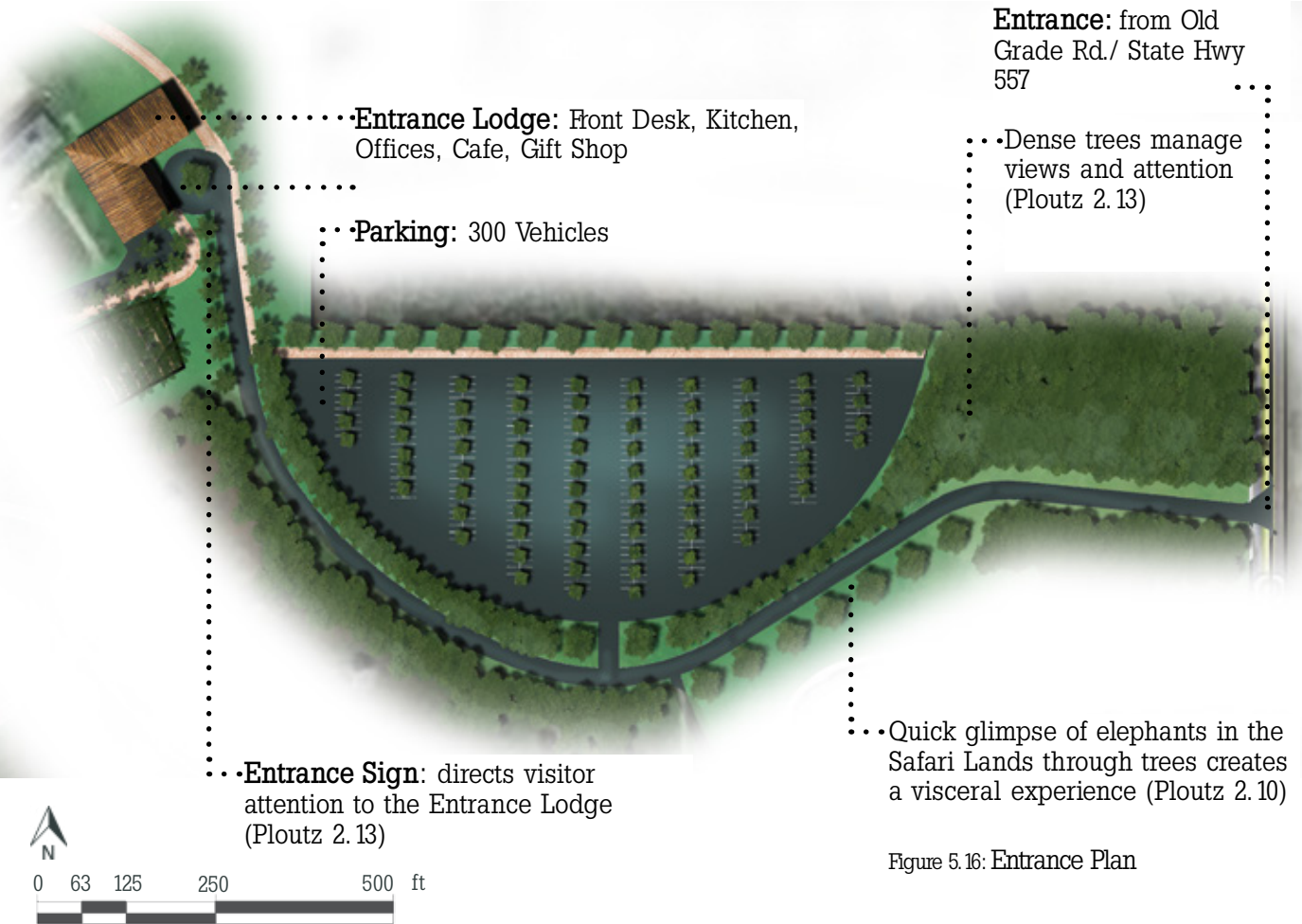


Figure 5.17: Example Architectural Character for Entrance Lodge and Cabins

APPLIED RESEARCH

Feature	Source
Controlled Views	Kilimanjaro Safari, Ploutz 2.13, Ploutz 2.10
Entrance Sign Relocation	Ploutz 1.3
Food Service & Cafe	Kilimanjaro Safari, Jaguar Rescue Center
Gift Shop	Kilimanjaro Safari, Jaguar Rescue Center

ELEPHANT EDUCATION TREK

Winding pathways, backdrop plantings, and varying terrain present visitors with a series of changing panoramic views Along the pathway guests will encounter education stop where they learn about elephants in the wild and in captivity.

Hours: 11:00am-3:00pm to Public
Sunrise-Sunset to Overnight Guests

Price: Included in Entrance Fee

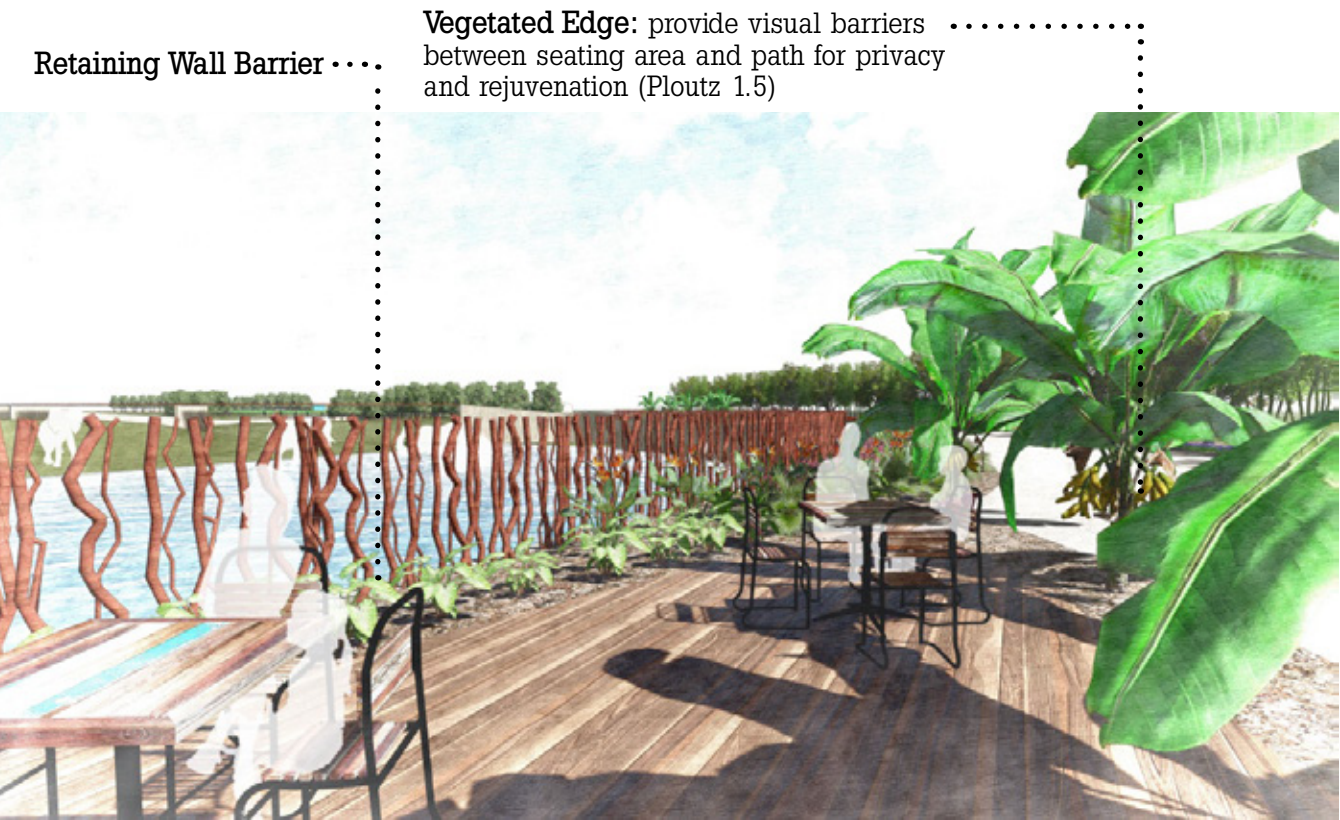


Figure 5.18: **Seating Overlook:** Guests may relax and dine next to wading elephants with panoramic views of the Education Trek (Ploutz 1.5, 5.5)



Figure 5.19: Education Trek Plan

Figure 5.20: Education Node #1

Land Encroachment

.....**Eaten Crops:** Concrete example of crops are linked with abstract concept of land encroachment (Ploutz 5.1)

...**Chili Pepper Plants:** act as barrier to crops because of elephants' distaste

.....**Healthy Crops:** protected by chili pepper plants



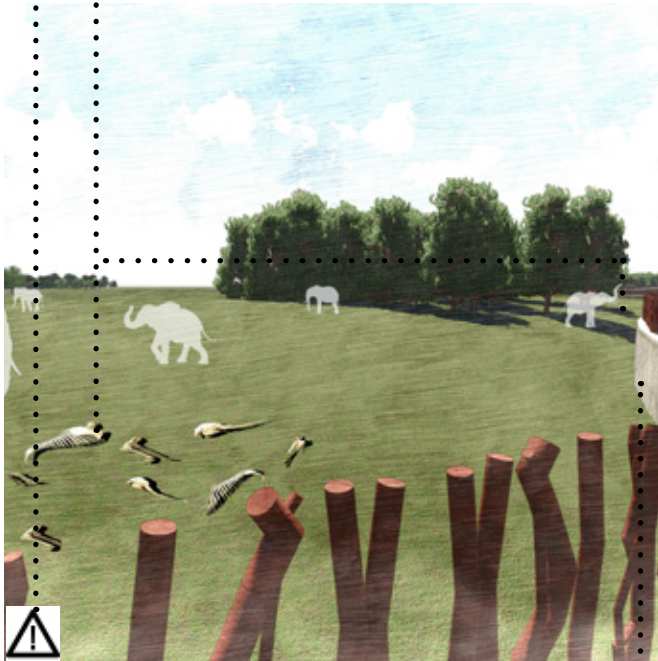
... Moat Barrier

Figure 5.21: Education Node #2

Poaching

.....**Warning Sign:** (not shown) diverging path warns families with young children of distressing situation (Ploutz 2.7)

...**Elephant Skeleton & Poaching Equipment:** powerful stimulus educating visitors about harmful illegal poaching practices (Ploutz 2.2, 2.3)



Retaining Wall ... Barrier

Figure 5.22: Education Node #3

U.S. Elephant Population

.....**Timeline:** shows abstract decline of U.S. elephant populations over the next sixty years (Ploutz 5.3)

...**Bridge:** leads guests into direct contact with information (Ploutz 2.13)

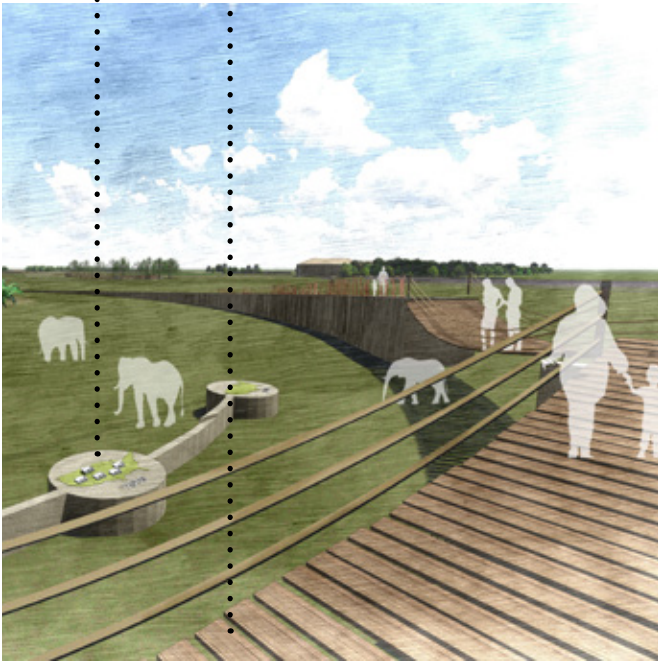



Figure 5.23: Education Node #4

Conservation Efforts

...**Conservation Efforts Display:** close up viewing opportunities of elephants highlight connections between information in the exhibit (Ploutz 6.2) Information presented ties together previous nodes (Ploutz 8.5), and leaves visitors on positive note (Ploutz)



... Permeable Concrete Wall Barrier



Figure 5.24: Education Trek Aerial

APPLIED RESEARCH

Feature	Sources
Interactive Features	Ploutz 5.4, Ploutz, 5.5
Trek Entrance	Ploutz 1.1, Ploutz 3.4
Visual Barriers	Elephant Manager's Association
Crops	CEC, Elephant Manager's Association, Ploutz 6.2
Seating Overlook	Dallas Zoo, Ploutz 1.5, 5.5
Education Nodes	Ploutz 1.3, Ploutz 2.5, Ploutz 2.9, Lessow 1990, Hyson 19999
Education Node #1	Ploutz 5.4, 5.5, ; Cohn, 2006; Rafiki's Planet Watch
Education Node #2	Ploutz 2.2, Ploutz 2.3; Cohn 2006;
Education Node #3	Ploutz 2.13, 5.3; Two Tails Ranch 2017, Scigliano 2002
Education Node #4	Ploutz 6.2, 2.8; CEC, Ager 2015
Moat Barrier	Dallas Zoo, Armstrong 2016
Retaining Wall Barrier	Elephants of the Zambezi River Valley
Permeable Concrete Post Barrier	Copenhagen Zoo

RINGLING ELEPHANT TREK

The second trek focuses on conservation efforts specific to Ringling and the CEC. Guests will have diverse viewing opportunities of the elephants and get a glimpse of how Ringling is working to protect the species.

Hours: 11:00am-3:00pm to Public
Sunrise-Sunset to Overnight Guests
Price: Included in Entrance Fee



- **Shade Structure:** focal point directs attention (Ploutz) and mimics elephant skin pattern (Ploutz 7.5, 7.8)
- **Overlook Platforms:** space for relaxation and recharging (Ploutz 1.5) that engages guests in visceral experience (Ploutz 5.5)



Figure 5.25: Overlook Seating Area

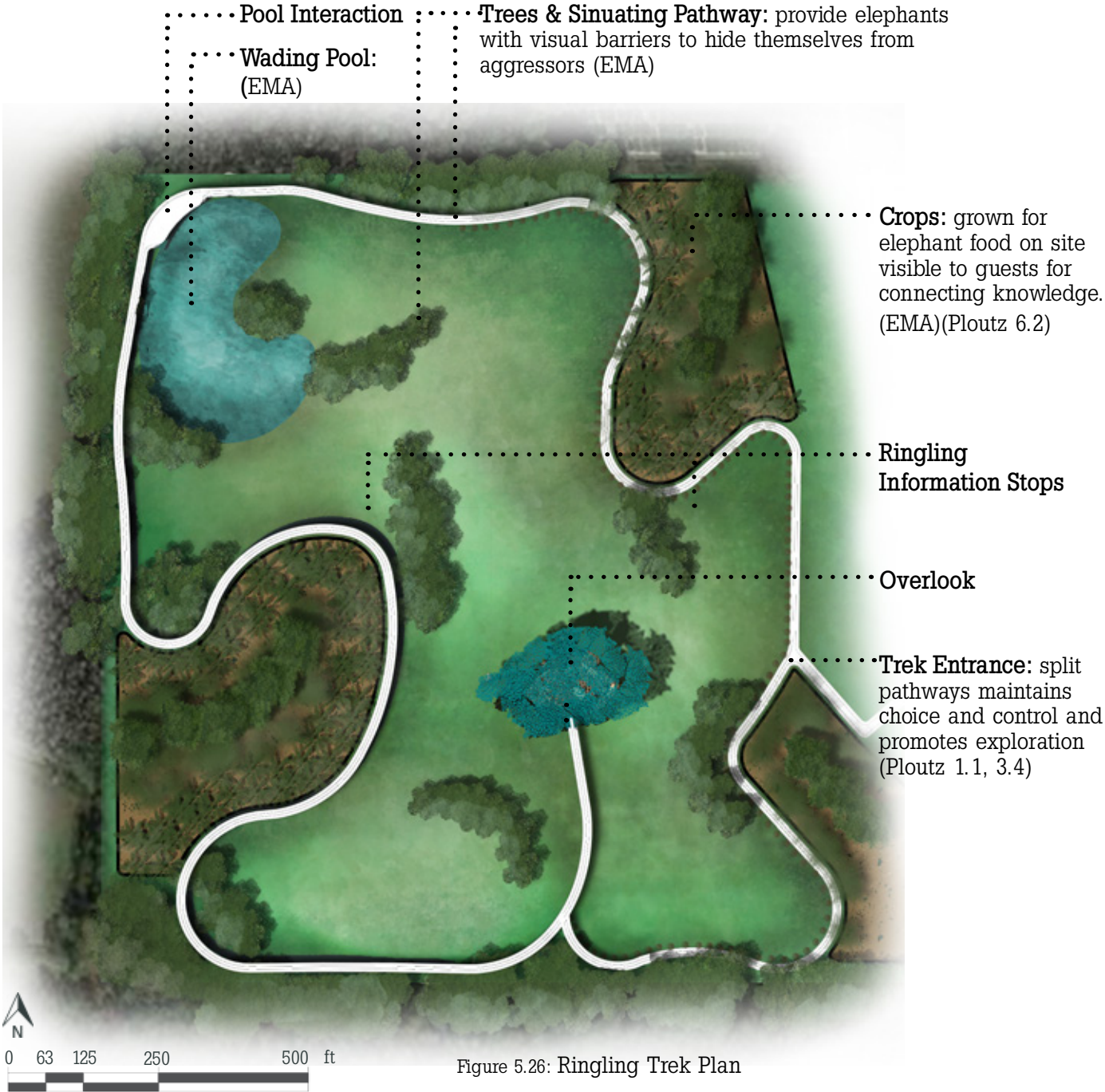


Figure 5.26: Ringling Trek Plan

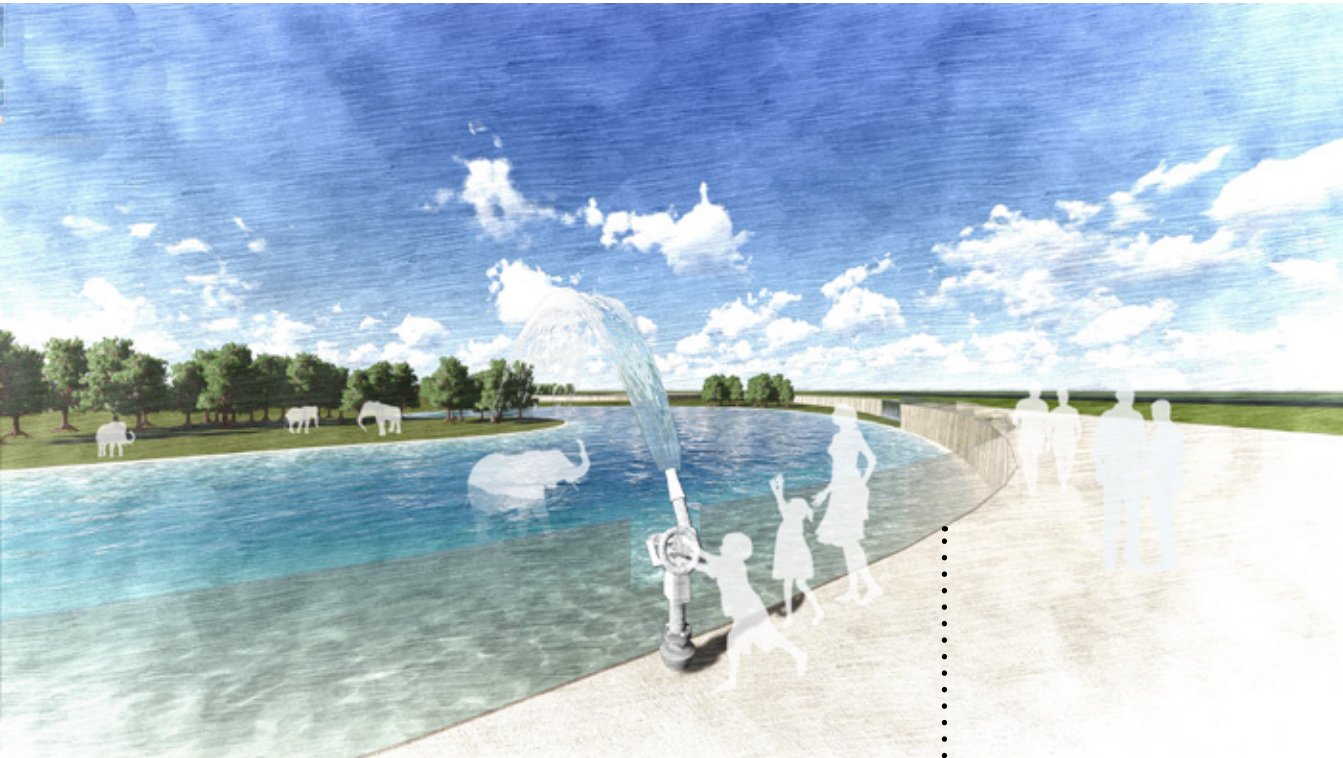


Figure 5.27: **Water Blast:** interaction experience engages guests (Ploutz 5.4), who get to see the reaction of the elephants when sprayed with water (Ploutz 7.4)

Retaining Wall & Pool Barrier

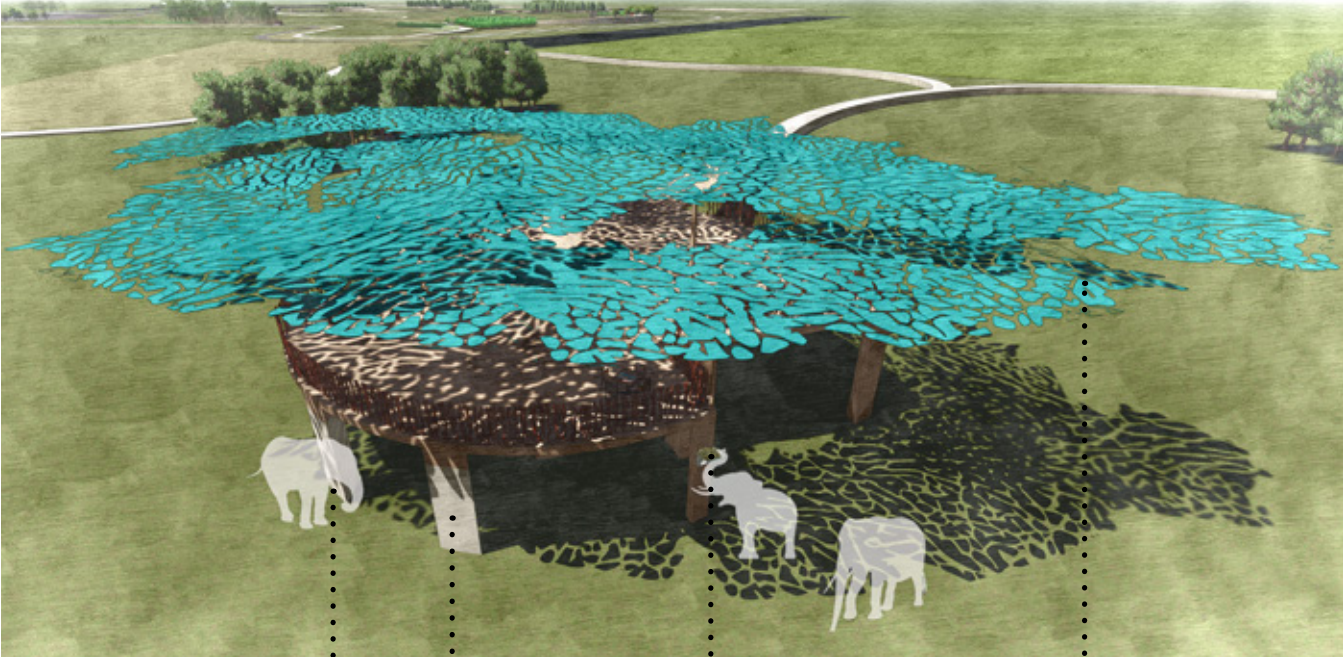


Figure 5.28: Overlook Aerial

Scratching Posts: (EMA)
Hanging Food: requires elephants to reach (EMA) and attracts them towards viewing area
Shared Shade: covers elephants and viewers

APPLIED RESEARCH

Feature	Source
Shade Structure	Elephant Manager's Association, Ploutz 2.1, Ploutz 7.5, Ploutz 7.8
Overlook Platforms	Dallas Zoo, Ploutz 1.5, Ploutz 5.5, Zambezi
Wading Pool	Elephant Manager's Association, Hamilton 193
Visual Tree Barriers	Elephant Manager's Association
Crops	Elephant Manager's Association, Ploutz 6.2
Ringling Information Stops	John and Mable Ringling Museum of Art, Lessow 1990
Trek Entrance	Ploutz 1.1, Ploutz 3.4
Retaining Wall & Pool Barrier	Elephants of the Zambezi River Valley, Denver Zoo
Water Spray Interaction	Oregon Zoo, Ploutz 5.4, Ploutz 7.4, McCray 2002
Scratching Posts & Hanging Food	Elephant Manager's Association, Zambezi

TRAINING CENTER

In the tertiary exhibit, guests can walk out to the patio for more 360 degree views of the elephants. In the middle of the patio stands a pavilion used for presentations educating guests on training techniques and elephant care. Although new elephants will not be trained for the circus, the CEC still needs to teach the elephants basic commands in order for the elephant to have good behavior necessary for veterinary care and personal interaction. The educational presentations may show retired circus elephants still living at the center, as well as elephants who have spent their entire lives at the center. Guests can also schedule “being a trainer” for an afternoon, elephant rides and hand feeding, that occur in this exhibit.

Hours: Show times at 11:00am, 12:00pm, 1:00pm, & 2:00pm

Additional activities are scheduled in advance

Price: Show Included in Entrance Fee

\$50 Trainer for a Day

\$5 Hand Feeding

\$40 Elephant Ride

\$80 Trainer & Ride Package

Berm: Creates backdrop to care training.....
(Ploutz 2.6)

Elephant Ride & Feeding Point:.....
Participating guests leave with a memorable experience (Ploutz 1.4, 6.5).

Elephant Trainer for an Afternoon:.....
Pavilion serves as briefing area and guided activities occur in the grasslands (Ploutz 1.4, 6.5, 7.6).

Decorative Concrete Wall: Stamped.....
with elephant markings and covered with vines, guides guests to central terrace



Figure 5.29: Training Center Plan

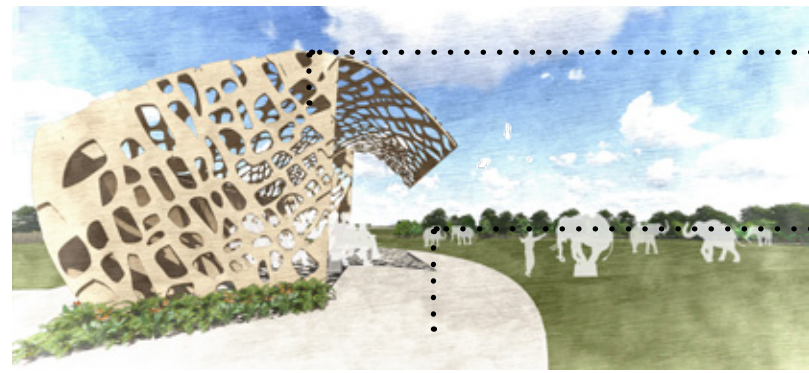
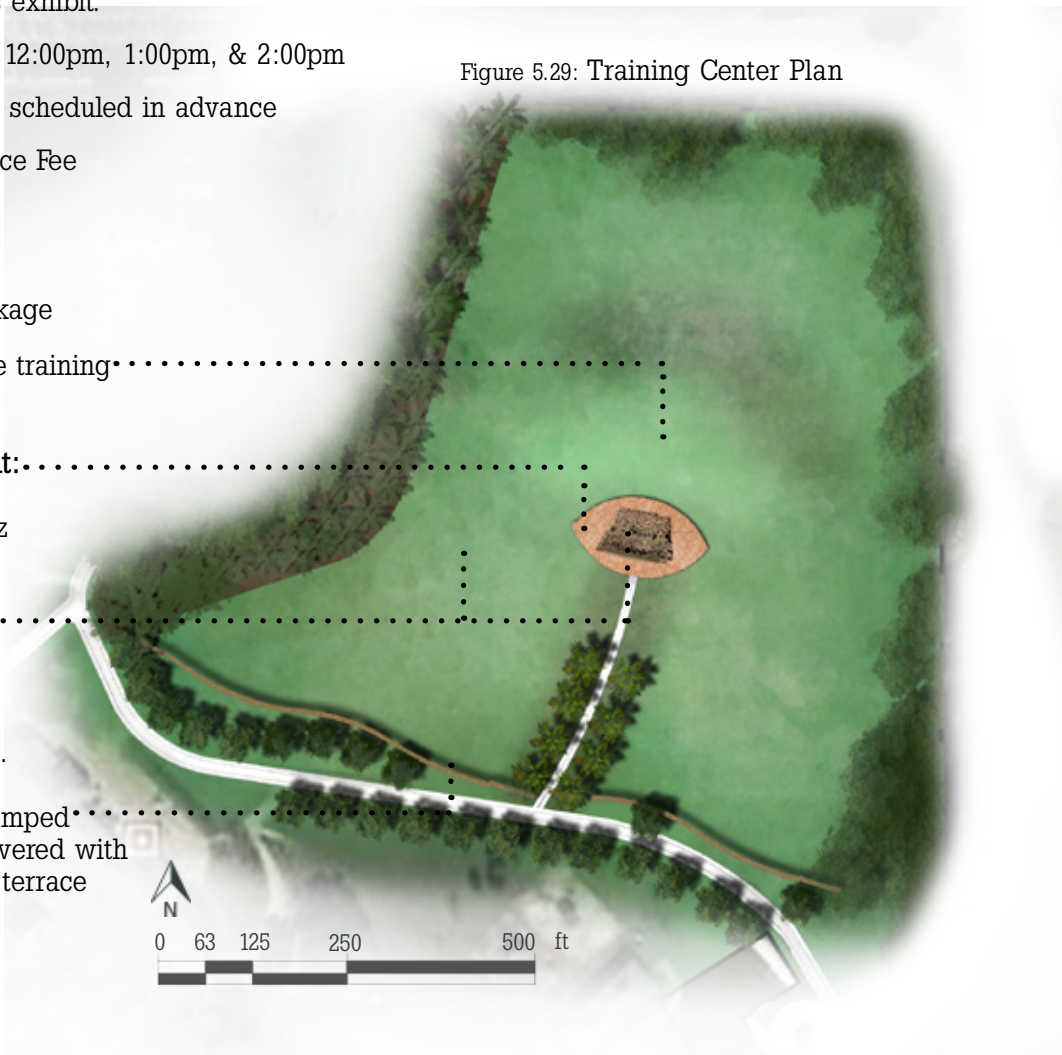


Figure 5.30: Outside Pavilion

Pavilion: The shape of the structure implies the shape of an elephant ear and its pattern mimics elephant skin (Ploutz 7.5, 7.8)

Terrace: The central location attracts guests to the main viewing area. (Ploutz 2.1)

Pavilion: Framed views direct.....
guest attention towards the speaker (Ploutz 3.1)

Speaker explains how simple care.....
training can provide the elephant with a purpose (Ploutz 2.11, 6.3)

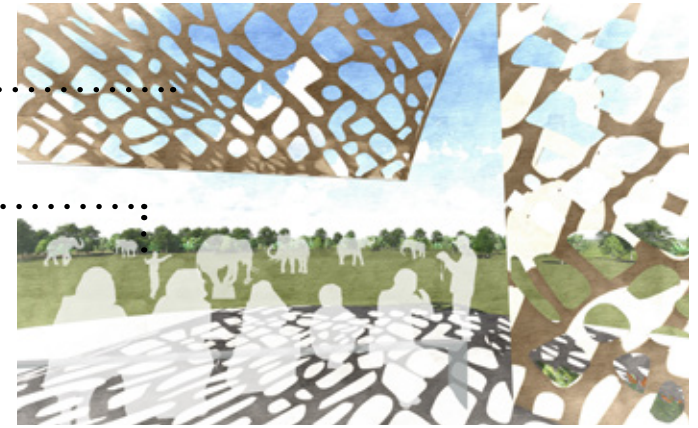


Figure 5.31: Inside Pavilion

APPLIED RESEARCH

Feature	Source
Berms	Animal Kingdom, Ploutz 2.6
Elephant Ride & Feeding	Two Tails Ranch, Ploutz 1.4, Ploutz 6.5, Hamilton 1993
Elephant Trainer for an Afternoon	Werribee Open Range Zoo, Patara Elephant Farm Ploutz 1.4, Ploutz 6.4, Ploutz 7.6, Brown 2005
Decorative Concrete Wall Barrier	Kilimanjaro Safari, San Diego Zoo
Pavilion	Ploutz 3.1, Ploutz 7.5, Ploutz 7.8
Terrace	Ploutz 2.1, Zambezi
Care Training Presentation	Two Tails Ranch, Jaguar Rescue Center, Animal Kingdom Back Stage Tales, Ploutz 2.11, Ploutz 6.3, Hyson 1999, Ager 2016

CARE CENTER

The existing facility of the CEC will be maintained, but retrofitted to support its new purpose. Guests will be guided through the center by a CEC employee, and have the opportunity to get a behind the scenes look at the food prep, veterinarian care, and research that the CEC does every day.

Hours: Tours at 11:00am, 12:00pm, 1:00pm, & 2:00pm

Price: Included in Entrance Fee



Care Center Tour Activities:

- Enclosure & birthing facility walk-through (Ploutz 6.4, 8.4)
- Participate in short lab experiment elephants' use in cancer research (Ploutz 6.1, 8.1, 8.2, 5.2, 7.3)
- Assist in building enrichment items (Ploutz 7.2 8.4)
- Prepare elephants' food (5.2, 7.1, 7.3)

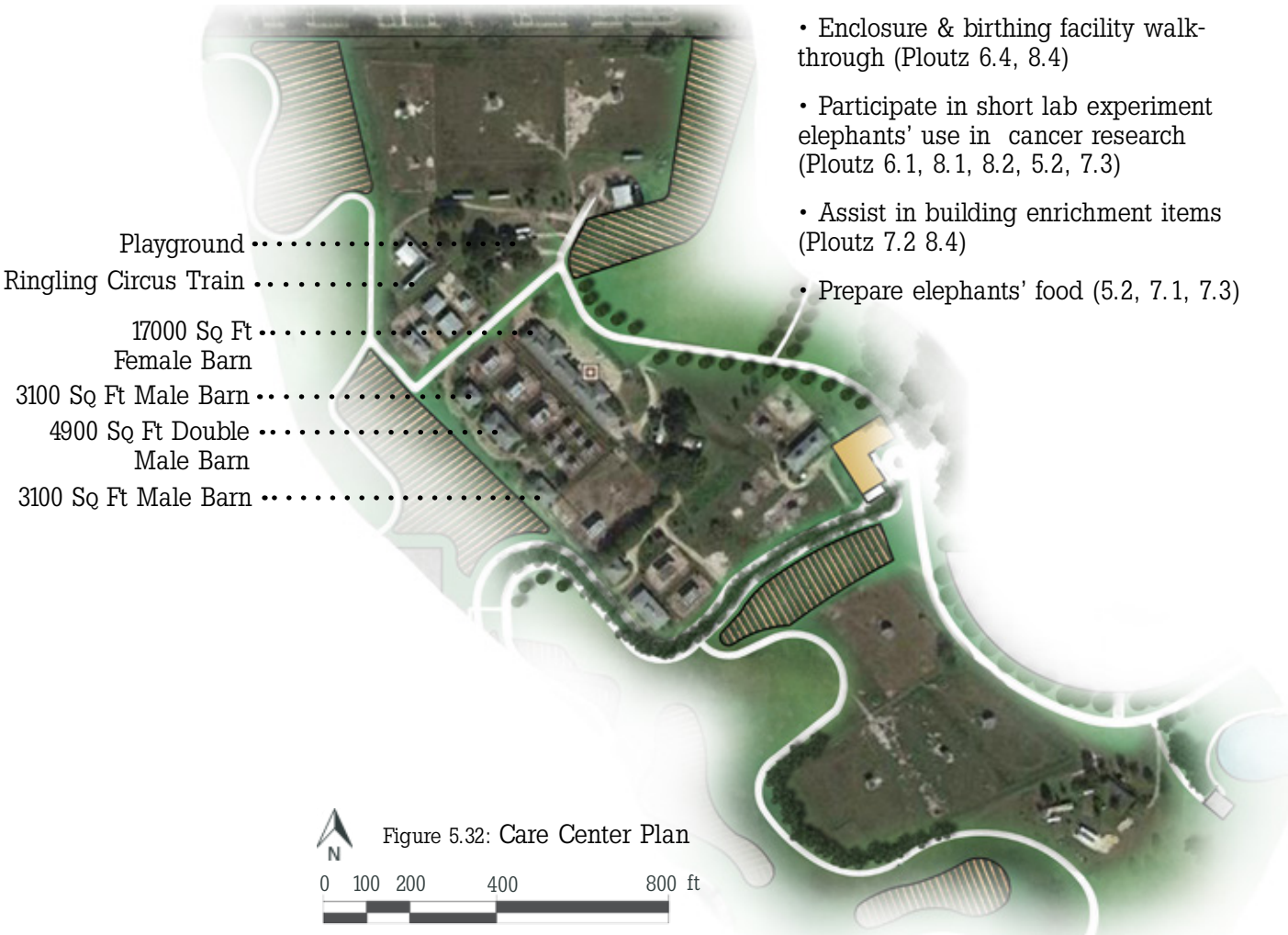


Figure 5.33: Aerial of CEC (Copyright ©2014, Feld Entertainment, Inc. All Rights Reserved. Used with Permission from Feld Entertainment.)

APPLIED RESEARCH

Feature	Source
Facility Tour	Animal Kingdom, Jaguar Rescue Center, Ploutz 6.4, Ploutz 8.4, Two Tails Ranch 2017, Cohn 2006, Hyson 1999, Ager 2016
Lab Experiment	CEC Lab, Ploutz 6.1, Ploutz 8.1, Ploutz 8.2, Ploutz 5.2, Ploutz 7.3
Enrichment Item Build	Ploutz 7.2, Ploutz 8.4
Elephant Food Preparation	CEC Feed Storage, Ploutz 5.2, Ploutz 7.1, Ploutz 7.3

SAFARI LANDS

Guests who would like an extremely unique and extended stay have the option to stay in an elevated cabin on the CEC's Safari Lands. Upon checking in at the Entrance Lodge, guests are escorted to a Safari Truck where they are taken through the open Safari Lands and dropped off at their private cabin. These safari trucks run hourly during daylight hours or upon request for transportation to other areas of the CEC. Guests will wake up to views of elephants grazing right in their front yard. For an exclusive experience, guests may stay in the CEC's deluxe lodge, of which proceeds are contributed directly to conservation and research efforts. Guests staying in the Safari Lands have exclusive access to safari truck rides, the Safari Trek, the Watering Hole, and recreation. Recreational activities exclusive to the Safari Lands are biking, kayaking, and stand up paddle boarding.

Hours: 24 Hours	Price Per Night:
4:00pm Check In	\$2500 Deluxe Lodge (up to 10 people)
11:00am Check Out	\$650 2 Bedroom Cabin (up to 6 people)
	\$450 1 Bedroom Cabin (up to 4 people)

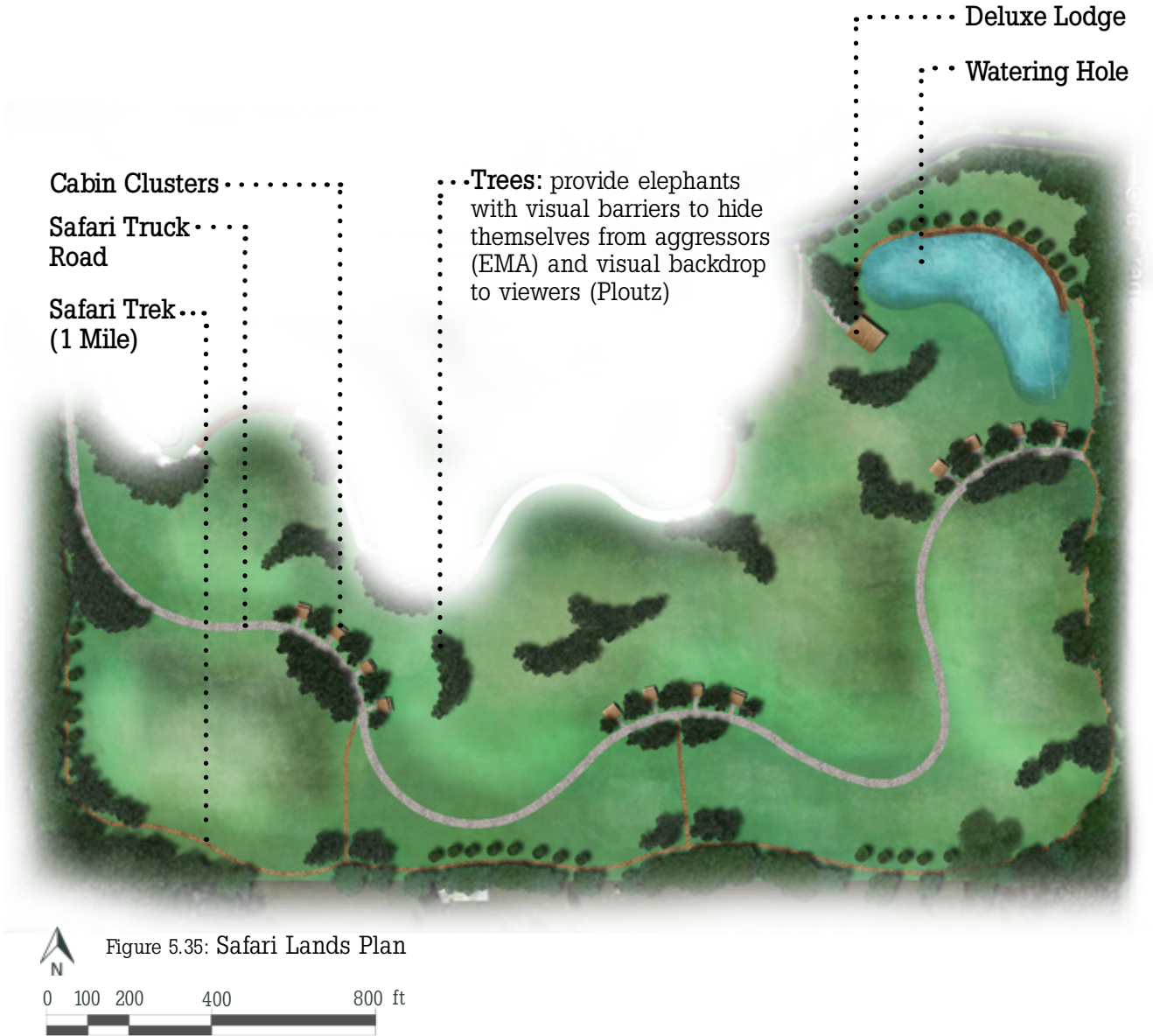




Figure 5.36: **Safari Lands Truck Ride:** Safari Lands stay begins with a safari ride through uninterrupted grasslands of grazing elephants (Ploutz 4.4 5.5)



Figure 5.37: **Cabin Entrance**



Figure 5.38: **Cabin Terrace:** Guests have panoramic views of grazing elephants (Ploutz 1.5, 5.5)

APPLIED RESEARCH

<u>Feature</u>	<u>Source</u>
Retaining Wall Barrier	Elephants of the Zambezi River Valley
Safari Lands Truck Ride	Kilimanjaro Safari, Ploutz 4.4, Ploutz 5.5
Visual Barrier Trees	Elephant Managers Association, Ploutz 2.6
Cabins	Jaguar Rescue Center Houses, Animal Kingdom Lodge
Cabin Terrace	Ploutz 1.5, Ploutz 5.5, Campbell 2011

WATERING HOLE

The Watering Hole is located on the northeast corner of the Safari Lands. Guests staying overnight in the Safari Lands have exclusive access to the Watering Hole during their stay. Here, guests may use the kayaks and paddle boards stationed on the boardwalk for an up-close encounter with wading elephants, and are protected by a barrier in the water.

Hours: Sunrise-Sunset
Price: Included in Overnight Stay

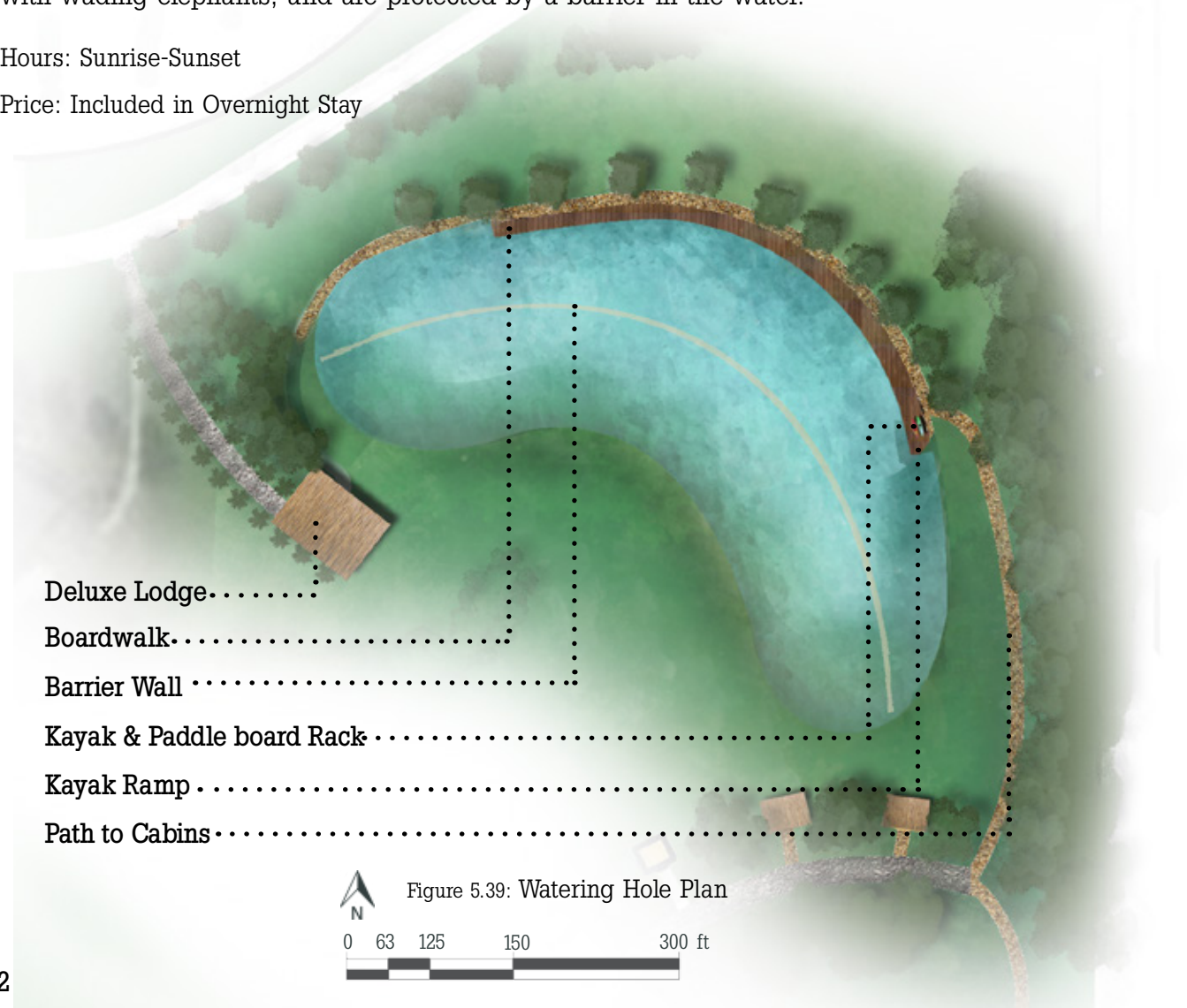


Figure 5.40: **Recreation at the Watering Hole:** subtle barrier wall creates opportunity for unique water interaction experience, but still provides safety and separation between elephants and guests (Ploutz 5.4, EMA)

APPLIED RESEARCH

Feature	Source
Concrete Wall Barrier	Elephant Manager's Association
Watering Hole Interaction	Ploutz 5.4, Hamilton 1993
Deluxe Lodge	Animal Kingdom Lodge

PHASING

Building the site over a period of multiple years will spread out construction costs and gage public interest in the CEC. The following is a phasing plan to build sections of the site based on logical visitor and elephant needs. After completion, each stage can be reviewed to assess if the next phase will increase revenue.



1. Open the existing CEC to the public



2. Elephant Education Trek



3. Expanded Parking and New Entrance Road



4. Training Center

Figure 5.41: Eight Phases of CEC Construction



5. Ringling Elephant Trek



6. One Cabin Cluster, Deluxe Lodge, and Watering Hole



7. Additional Cabin Clusters



8. Safari Lands Enclosure and Safari Trek

CHAPTER 6

CONCLUSION



Figure 6.1: Kilimanjaro
Safari Bamboo

The purpose of this project was to discover how design can promote conservation and offer unique experiences with exotic animals, specifically elephants. The newThis proposed design offers an approach to educating the public while being sensitive to the particular needs of elephants. Guests are given opportunities for hands-on learning and unique interactive experiences. The design and programs of the CEC guide personal exploration, ignite a personal connection, promote health and safety of both elephants and guests, and leaves guests feeling fulfilled. The powerful messages instilled through the CEC connect the animals to a larger purpose.

Background research and findings from methodology are used to support design decisions made for the CEC. In the past, animals have been shown for their entertainment value, however an opportunity for new ways to show animals has evolved. Criticism from animal activists and financial constraints have forced many zoos to close their elephant exhibits. Current trends and publicity surrounding zoos have created a desire for places like animal sanctuaries. Inventories from successful precedent models provide a basis for the implementation of the programming and features of the new CEC design. Analysis of Ploutz's Zoo Design Guidelines provide support for conservation education strategies employed. Creative thinking was necessary to develop unique, safe, and interactive experiences for guests.

Success of this idea will rely upon available funding, consistent tourism attendance, and public support. Proponents of the project would most likely be Feld Entertainment, conservationists, and hopeful visitors. Opposition includes animal activists groups and similar organizations currently criticizing the CEC. However, if the new site is successful in positively promoting itself to the public, some opposition may retreat. The argument most likely to come from opposition is that the elephants should be able to live in peace and not be put on show. While it is possible that too many visitors could stress elephants, the visitor capacity and elephant rotation between enclosures should be monitored and adjusted to accommodate the elephants. The benefit of promoting conservation efforts outweighs the possibility of a minor impact on the elephants. Because of their popularity, the Ringling elephants are an opportunity to serve as models for their species and raise awareness of conservation for their larger natural habitat.

While there is very little direct connection between tourism and conservation in the United States, current trends in zoos and similar attractions suggest that the public could be supportive of this combination. Challenges will include ensuring that visitors will leave with an awareness, if not a passion, for wildlife conservation. Experience objectives should promote a positive image of the Ringling CEC and their elephant care practices. Benefits of the combination of tourism and conservation will include funding, awareness, and public approval for continuing the conservation practices at the CEC.

LIMITATIONS

The main limitation of this project was not being able to visit the current site in person. A site visit to the CEC in addition to further communication with employees would have given the project more direction and feasibility. If given more time and money, additional site visits to a larger pool of precedents would have been useful during analysis. Financial information was very limited to general costs found online, therefore it is possible that the financial analysis results could be very skewed. Because of the extensive research required for this project, as well as the large size of the chosen site, time for the design process was limited. More time could be dedicated to developing more specific details.

FUTURE RESEARCH

Future research could involve more direct contact with Feld, Ringling, and the CEC. A larger inventory of precedents could be analyzed in order to develop a more extensive design. Interviews could be held with professionals in the industry to gain opinions on health, safety, and conservation issues. Zoo visitors themselves could also be analyzed to further investigate visitor needs and expectations.

CONCLUSIONS

The research presented led to an experiential design welcoming visitors to Ringling's Center for Elephant Conservation. This research can serve as a model for future projects incorporating conservation, education, and animal interaction. Through precedent studies, financial inventories, and guideline analysis, a new design allows the CEC to add a tourism component, promote conservation, and continue to care for its elephant residents.

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