Cincinnati Zoo & Botanical Garden: South American Exhibit

An Honors Thesis (LA 404)

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The primary purpose of zoos today is to provide an immersive and educational experience for the visitor. However, many zoos around the world are designed in such a way that a disconnect is created between the visitor and the animal. Modern zoos have come a long way from the barred cages of a century ago. While direct contact is not possible with most animals, a more immersive, personal experience is always achievable through good design. Today, visitors usually enjoy a more natural setting in which the animals are viewed. Often times, there are not even any visible barriers between the visitor and the animal. This new school of thought on how a zoo should look and act has given visitors a much more valuable experience by allowing them to view animals in a similar way in which they might see them in the wild. However, even today, there still exists a visitor-animal disconnect, resulting in the need for furthering the concepts of what an exhibit should be.
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South American Exhibit

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To Steve Foltz and the Cincinnati Zoo, for a great summer and the inspiration for my project.

To Malcolm Cairns, for your advice and guidance.

To my Mom and Dad, forever together at heart.
The primary purpose of zoos today is to provide an immersive and educational experience for the visitor. However, many zoos around the world are designed in such a way that a disconnect is created between the visitor and the animal. Modern zoos have come a long way from the barred cages of a century ago. While direct contact is not possible with most animals, a more immersive, personal experience is always achievable through good design. Today, visitors usually enjoy a more natural setting in which the animals are viewed. Often times, there are not even any visible barriers between the visitor and the animal. This new school of thought on how a zoo should look and act has given visitors a much more valuable experience by allowing them to view animals in a similar way in which they might see them in the wild. However, even today, there still exists a visitor-animal disconnect, resulting in the need for furthering the concepts of what an exhibit should be.
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"The mission and vision of the Cincinnati Zoo & Botanical Garden is dedicated to creating adventure, conveying knowledge, conserving nature, and serving the community."

-The Cincinnati Zoo & Botanical Garden
The Cincinnati Zoo & Botanical Garden officially opened in 1875, making it the second oldest zoo in the United States. The Zoo's original animal collection consisted of only a few animals, including eight monkeys, two grizzly bears, three deer, six raccoons, two elk, a buffalo, a hyena, a tiger, an alligator, a circus elephant, and over four hundred birds.

Being recognized for its significant architecture featured in the Elephant House, Reptile House, and Passenger Pigeon Memorial, the Cincinnati Zoo was designated as a National Historic Landmark in 1987. The Reptile House is the country's oldest zoological building, dating back to the Zoo's opening in 1875.

Dedicating itself to education, the Cincinnati Zoo became part of the Cincinnati public school system in 1975, and hosts a four-year college called the Zoo Academy. Today, over 300,000 students participate in the Zoo's educational programs every year.

The Cincinnati Zoo & Botanical Garden has become well known for its successful captive breeding program, often being called the "Sexiest Zoo." Today, the Zoo's Lindner Center for Conservation and Research of Endangered Wildlife (CREW) has made it a leader in the protection and propagation of endangered plants and animals. Over the years, the Cincinnati Zoo grew to feature more than 500 animal and 3,000 plant species, making it one of the largest collections and a top rated zoo in the United States. Annually, the Zoo attracts over 1.2 million visitors to view its amazing exhibits and gardens. (CincinnatiZoo.org)

**Vision and Mission**

**Adventure. Conservation. Education. Community.**

The mission and vision of the Cincinnati Zoo & Botanical Garden is dedicated to creating adventure, conveying knowledge, conserving nature, and serving the community.

With the addition of our fourth pillar to our Mission Statement, Serving Community, we recognize the responsibility to partner with diverse and economically challenged communities in our daily work.


*Taken from the Cincinnati Zoo & Botanical Garden's website, cincinnaZoo.org*
As it exists today, the Cincinnati Zoo and Botanical Garden sits on a 70 acre site with no opportunity for off-site expansion. As it is one of the oldest zoos in the country, much of its design and infrastructure is based on old ideas of zoological exhibition. However, the Zoo has dedicated itself to keeping itself updated with new and fresh exhibits for the wellbeing of its animals and the enjoyment of its visitors. Currently, the Cincinnati Zoo is going through an aggressive renovation and on-site expansion process, as per the master plan developed by CLR Design of Philadelphia, Pennsylvania. Because the area around the Zoo has been built up over the past century, expansion into their on site parking lots is the only option for a much desired growth of exhibits. One such expansion is the new African Safari zone. The Cincinnati Zoo is in the building process of turning their 3 acre eastern parking lot into an African themed zone. This will include giraffes, cheetahs, wild dogs, hoofstock, hippopotami, and other African animals. This leaves one remaining parking lot on the northern edge of the Zoo, which the planning committee has considered turning into a South American themed zone. However, planning and design work has yet to be started. This is the project that I have chosen to focus on in this study.
How can a South American exhibit that fits into the overall master plan be designed to create a more immersive experience for visitors at the proposed site at the Cincinnati Zoo?

**Project Sub-problems**
- What kinds of limitations does the Cincinnati Zoo's site put on the "ideal exhibit?"
- What are the visitors' current feelings about the Cincinnati Zoo (i.e. what types of improvements could be made, what are the strengths of the zoo)?
- What are the current living conditions for animals at the zoo?
- What is the Cincinnati Zoo's message that it wants to instill in its visitors with its South American exhibit?

**Research Sub-problems**
- What can be learned from the evolution of exhibit design from past to present to better understand where exhibit design should go in the future?
- What makes a "successful exhibit" today?
- Why is there a desire for change?
- How does specific animal behaviors determine/limit its possible exhibit designs?
- What new technologies could be applied?
Significance

There is a great importance in furthering the concepts of what a zoo could be. Every zoo has what is called a "zoo message" that it tries to instill in its visitors. The Cincinnati Zoo's official message is adventure, conservation, education, and community. I will specifically be focusing on adventure, conservation, and education in this project, as the Zoo achieves its goal of community building through community outreach programs.

The exhibit is where the message is passed from the zoo to the visitor, which puts great significance on making each exhibit as immersive and educational as possible. This is why new techniques and philosophies must always be explored, to bring new and better information, as well as ways of conveying the information, to visitors. With limited space for expansion, the Cincinnati Zoo must take advantage of every new project, making it as innovative and as special for its visitors as it can.
"When I hear of the destruction of a species, I feel just as if all the works of some great writer have perished."

- Theodore Roosevelt
RESEARCH
Review of Literature

“The zoo is primarily a place to display animals for man’s understanding and enjoyment. The zoo exhibit, like the theater, is concerned with creating illusions to carry a particular message or attitude. Its success is dependent on the images and messages it conveys to the visitor”(Polakowski, 11). It is the job of the landscape architect to design a setting that expresses the overarching message of the zoo by using seamless illusions of the natural environment. Today, there are four major “dilemmas” that a designer faces when working with a zoo:

1. Showcasing animals as good and naturally “deceiving”
   a. While the act of placing wild animals in an exhibit removes their natural behaviors (predator, prey, migration, etc), it is the job of the designer to create an exhibit where visitors are deceived into believing they are viewing a wild animal exhibiting wild characteristics.

2. Educating visitors
   a. Through proper design, the conveyance of information, and a replication of nature, an exhibit should be able to educate the visitor on issues, particularly those that are human induced, that different ecosystems are experiencing throughout the world.

3. Satisfying the needs of the animals
   a. This is the most important dilemma faced by the designer as a good zoo cannot exist without healthy animals exhibiting their natural behaviors. Through good design, the needs of the animals can be met.

4. Clarifying the role/message of the zoo
   a. Exhibits should be able to show the research, conservation, education, and recreational goals that the zoo is striving to achieve.

It is the landscape architect’s duty to satisfy these criteria by striking a balance among all of them. By doing this, a natural exhibit in which the animals’ needs are satisfied and the visitors are properly educated can be created. (Polakowski, 2-4)
History

Although the exhibition of animals has existed for thousands of years, major development did not occur until the past century. The start of this development is typically marked with the opening of the Hagenburg-Stellinger Zoo in Germany, designed by Carl Hagenbeck in 1907 (Polakowski, 20). This zoo began the practice of open-air exhibits, which opened the door for a myriad of future design possibilities. Prior to this, zoo practices remained very primitive in nature, relying primarily on using the animals solely as a source of entertainment rather than education. Zoos consisted of human structures housing caged animals. This is where the terms “Ape House” or “Cat House” came from (terms that are still used today). Visitors entered these buildings and saw animals behind bars, often dressed in human clothes or fed human foods for the amusement of the crowd. In this setting, animals were no more than inmates. While one could say that the animal-visitor interaction was very high in this setting simply due to proximity, it was based on a primitive notion that wild animals could and should be thrust into human context. (Straughan, 123-40)
The Transition

The beginning of the transition from the old zoo to the new zoo was first brought about because of several factors:

1. Ethics
   a. People were forced to ask themselves how ethical it was to sentence animals to a life behind bars.

2. Technology
   a. Technology was another catalyst as it was quickly becoming possible to build more elaborate enclosures for animals.

3. Visitor Expectations
   a. This was perhaps the most powerful motivation behind the evolution of the zoo. "Many visitors to the zoo look with disdain at zoo officials, upon seeing a lion or bear pacing back and forth in its concrete and steel cage"(Straughan, 128). As visitors demanded more, zoos were forced to react.

These factors caused the opening of the Hamberg-Stellinger Zoo, the first zoo truly designed for both the visitor and the animal. "The cage bar was eliminated as a physical and visual barrier and replaced by moats, many of which were hidden, to contain the animals and to permit unobstructed views of the staged display. The use of vegetation, rocks, logs, similar to stage props, helped create long panoramas containing various animals within a 'natural habitat.' Hagenbeck's goal was to artificially create a landscape as good as nature"(Polakowski, 20). Although the new standard of exhibits were hardly accurate reconstructions of any particular
animal's natural environment, it was a huge step in the right direction. Once bars were removed from the zoo, the transition from Hagenbeck's model to today's, using more accurate reconstructions, was a predictable, natural progression. Several decades later, a fourth factor went into evolving the zoo into what it is today:

4. Cultural shift from human-centric to biocentric views (Powell, 98)
   a. Prior to the Endangered Species Act of 1973, zoos were net consumer of animals. However, after the act was passed, "they were forced to change because of trends affecting the world's wildlife. The Act limited the collection of many different species by zoos and, out of necessity, forced them to start captive breeding programs" (Polakowski, 20).

Today's Model

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Conveying the Zoo Message

Today, every zoo has a particular message that it is trying to send towards its visitors. It has become the zoo’s duty to educate, rather than simply entertain. As the designer, through focusing on the interrelationship between people, plants, and animals, both in the exhibit itself and through information displayed to the visitor, this can be achieved. In addition to the exhibit, interpretative displays can be
used to give visitors a greater appreciation of nature and the impact that humans have on it. “Generally people retain little of what they hear, some of what they read, half of what they see, and a great deal of what they do” (Polakowski, 113). This falls under the general zoo evolution of observation to participation. They should understand the present conditions of the world’s wildlife and be inspired for the future. It is the job of all exhibits to allow the “visitors [to] leave the zoos with a respect for the animals, their intrinsic value, and the actions and policies that are contributing to their destruction” (Polakowski, 80).

Visitor Experience

An important component to a good zoo design is making sure the visitor has the desired experience. This can be affected both with the interior and exterior of an exhibit. Within an exhibit, visitors expect authenticity and attention to the animal’s needs. Without these two things, the illusion of nature is lost. For instance, visitors are attracted to an animal performing its daily habits and functions. Not only is this for the sake of the audience, but also the well-being of the animals.

Outside of the individual exhibit, a sequence of experiences can be made leading up to the viewing area that heightened anticipation and curiosity. When dealing with predatory animals, inducing a sense of fear can be a good way of holding a visitor’s attention. In addition, it is important to manipulate the visitor’s experience using all of their senses, from sight to sound, smell, and touch. The end goal of an exhibit design is to have a place where total “landscape immersion” can take place. (Powell, 82)

Design Components

Achieving the message of the zoo, visitor immersion, and animal well-being are the goals of a well designed zoo exhibit. However, it takes certain components to accomplish these goals. The first decision a design must make is to create an exhibit
that is realistic, modified, or naturalistic. A realistic exhibit reproduces a habitat in appearance, land formation, plant life, and animal activity. This type of exhibit is usually not attainable unless the exhibit is imitating a local biome. A modified exhibit substitutes in native plant life to create as close to a realistic habitat as possible. In both a realistic and a modified exhibit, it is desirable to create a living, breathing exhibit, meaning that the exhibit is a working habitat that functions as it would in the wild. On the other hand, a naturalistic exhibit does not attempt to imitate a natural habitat, but simply uses natural materials to create an aesthetically pleasing space. (Polakowski, 90)

Creating a space in which animals show their natural habits is important to the education of the visitors. This can be done by forcing the animal to gather food in a natural way, or provide natural resting places, such as a crook in a tree or a small cave. An important choice in doing this is using artificial vs real items in the exhibit. While real props are not always possible, the use of artificial items can recreate a habitat in a way that allows the animals to exhibit natural behaviors. However, artificial items, no matter their use, can create a negative reaction from the visitors. (Polakowski, 98)

Creating a gradient of habitats in a single exhibit is also an excellent way to teach visitors about the interrelationships between different biomes and animals. For example, a single exhibit can show an altitudinal gradient, with a mountain habitat fading into a lowland habitat. The exhibit shows not only the importance of the transitional spaces to certain animals, but also the reliance and interactions of those animals. Other possible gradients include ecological (seashore to underwater) and latitudinal (grassland to desert). (Polakowski, 95)

The size of an exhibit has several factors. A large exhibit is not always needed for every animal. Providing enough space for the behavioral needs of each animal is important. While this can certainly be easier to do in a large space, it is certainly possible in smaller exhibits. However, when working with a smaller space, a design must take care to not be repetitious, as visitors will notice this more in a confined area. Any exhibit must avoid rectangular or regular perimeters, as this destroys the natural illusion for the visitor because it is an intrusion of a man made shape in a supposedly natural setting. When considering size and shape, a
designer must also consider the vertical element, as many animals spend time in more than just one plane (i.e. ground plane, trees, canopy, etc.). (Polakowski, 102).

Observational opportunities are also a very important consideration in designing an exhibit as it is the point at which a visitor will experience the animal and the space. Therefore, the design of an observation area is effectively choosing what experience the designer wants the visitor to have. The first consideration is how many sides the exhibit is viewed from. One-sided viewing creates a two-dimensional experience for the visitor that borrows background scenery to create a realistic backdrop. An exhibit with viewing from multiple sides creates a more three-dimensional experience, but the designer must take care to block each observation area from one another, as seeing other humans while viewing the exhibit only reminds the visitor that they are at a zoo and not in the wild. It is also important to block other views, such as buildings or containment methods. The elevation of the viewer compared to the animal is also important. When viewing from above, not only does the exhibit seem smaller, but the visitor feels superior to the animal. A
more face-to-face view with the animal is intimidating and forces the visitor to respect the animal more. However, there are exhibit types in which a top-down view is appropriate, depending on what it is the exhibit is supposed to be showing. (Polakowski, 121).

The Future

One of the major factors guiding the future of exhibit design is focusing on providing as many choices for the animals as possible. "The challenge for us is, how many ways can we give the animal to manipulate its world? We [should not] decide [what is] best for it. [That is] a major frontier [we are] looking at right now. Whatever the zoo, whatever the circumstances, whatever the director, whatever the constraints we must give the animals as many choices as possible" (Powell, 98). This, in many ways, goes back to the goal of recreating the natural habitat as closely as possible. However, this takes a different approach in not only imitating materials and settings, but also imitating and recreating the decisions that animals must make in the wild.

Included in the idea of providing choices is the idea of creating multiple spaces for animals to use for different purposes. Current models have animals perform all their functions within a single space. However, just as humans have different rooms in their houses, each intended for a different use, this concept can be translated into the animal realm. This provides that ability to give the animals a variety of environments throughout the day, much like they would experience in the wild. (Powell, 92)

A third major frontier is visitor interaction. This can be achieved in many ways, from more innovative observation opportunities to direct interaction with the animals. Creating these so that the experience can be had in a safe and controlled manner is key.

Overall, the future of exhibit design has many of the same goals as current exhibit design: creating an educational visitor experience, providing for all of the animals needs, etc. However, the idea on how this can be best achieved is changing as we better understand the needs of animals, both physical and physiological. Though our better understanding of these two things, we are able to better design an area that will give visitors a superior educational experience.
Zoo Paris-Vincennes

The Zoo Paris-Vincennes was originally built in 1931 for the World Exposition. Due to shifting visitor expectations and the desire for ecological honesty, the zoo recently went through a complete renovation. The main concept behind the renovation was to create an environment in which "animals are no longer exhibited 'out of context,' as curiosities of nature, but as inseparable parts of a chain" (Nani, 73). As a consequence, the zoo decided to cut the number of animals that were exhibited down to better allow for more accurate and meaningful environment recreations. Visitors walk seamlessly through several exhibits in a given biome that literally take up the same space. For example, the path starts at ground level, where visitors view pigmy hippopotami. The path then raises and shows visitors the first canopy level, which showcases several types of apes living together in the same space. Finally, the path rises to the tops of the trees where visitors can see the various birds that live in the biome. If an animal is not part of a chain, it is not included in the exhibits. (Nani, 73-7)

This case study will be very useful in looking at possible designs for the Cincinnati Zoo's project, as a path in changing elevations is possible on site and would allow visitors to view animals at multiple canopy levels, giving a more accurate and educational experience.
Lied Jungle, Henry Doorly Zoo

Lied Jungle is considered Henry Doorly Zoo’s first total immersive exhibit. The exhibit is a 1.5 acre, indoor rainforest where “guests can see, touch, smell, hear and become part of the natural rainforest environment while observing animals that are free ranging or contained behind water and rock barriers” (Lied Jungle, 2). Visitors move through the three zones of Asian, African, and South American rainforests at varying elevations where they can see the native animals of those zones. All parts of the building, such as walls and ducts are covered with natural and artificial scenery. Several large, realistic, fiberglass trees acts as nodes that move visitors through the space. In addition to the animals, visitors are exposed to medicinal plants that give them an appreciation for both the fauna and flora of each biome. (Lied Jungle)

This case study will be particularly useful in learning how to create a respect for the plantlife of South America while also using artificial scenery. It also shows the pros of an indoor exhibit versus an outdoor, as climate controlled indoor exhibits can use exotic flora and showcase special specimens such as medicinal plants.
Treetop Trail, Philadelphia Zoo

The new Treetop Trail at the Philadelphia Zoo focuses on both the visitor experience as well as the quality of life for the animals. The exhibit consists of elevated walkways that move through the canopy of a forest. On either side of the path, primates are allowed to explore large, expansive exhibits. The animals have a different experience everyday as the exhibits are timeshared, meaning the different primates rotate through the spaces each day which stimulates them with new environments as well as smells from other animals, both of which contribute to a more accurate representation of the natural habitat. An invisible mesh system separates the visitors' elevated walkway from the animals, giving them an uninhibited, natural view. (Philadelphia Zoo)

This case study is very useful in looking at innovative ways to balance the experience of the visitor with innovative ways of giving better living conditions to the animals. These two factors are directly related as happier animals contribute to the overall experience and educational value that an exhibit can offer the visitors.
Site Specific Findings

The project I have chosen for my thesis is an exhibit expansion for the Cincinnati Zoo. After discussing the issue with the zoo, I discovered that they have the idea of transforming their last remaining onsite parking lot into a South American exhibit zone. As the Cincinnati Zoo has a very restricted site to work with (70 acres), it has been turning their onsite parking lots into exhibit space and moving parking to offsite areas. Currently, the zoo is in the building phase of turning one of their parking lots into an African Exhibit area.

As I discovered in my literature review research, it is a growing trend for zoos to organize their exhibits according to biome rather than taxonomy. This means that zoos want Africa, Australia, or South America zones rather than having Cat, Ape, Reptile, or Aviary zones. Because the Cincinnati Zoo is the second oldest zoo in the United States, established in 1875, it is primarily set up in a taxonometic fashion. In recent years however, it has begun the transition into becoming a more biome focused zoo, most notably with the construction of its new African zone. Although taxonomy is a logical organization for animals, biome focused organization is superior in several ways. Most importantly, it allows for a seamless, consistent, accurate, whole, and convincing landscape from exhibit to exhibit. This allows for a greater immersive quality for the visitor. In addition, it is also more effective at educating the visitor about certain biomes and creating an appreciation for them. Visitors can see the interrelationships between the animals and their landscape, and also the animals to one another. This is why I have chosen this particular site and project for my thesis. I believe that it will create a better quality experience for visitors of the Cincinnati Zoo and allow for a better environment in which the animals can live.

The first site information that I looked at is the physical site limitations, including size, topography, and potential visual characteristics. From information that I gathered from site surveys received from the firm Cornette/Violetta Architects (the firm that the zoo works with), the site measures out to be three acres. This includes the entire parking lot and access road that runs between it and the zoo itself. Topographically, the site is very flat, as it is a parking lot. This will provide for a particular challenge as topography is a very important aspect in recreating
a habitat for an exhibit. It is useful for creating backdrops, natural realism, and containment of the animal. In addition, a project that I worked on while I interned for the zoo was the possible installation of two one-hundred thousand gallon water storage tanks under this site. The tanks would catch runoff from one-third of the zoo’s campus. The potential existence of two large tanks under the site would restrict any topographical changes to fill only, as they would interfere with any cuts made.

Another set of information needed under site conditions are the site’s climate and microclimates. Cincinnati’s climate as a whole includes hot, humid summers, reaching 90° or more, and cold winters, dropping down to 30° or lower. Average annual precipitation is 40 inches spread roughly evenly through all twelve months. More important to the design of the site however are the existing local microclimates. The largest microclimate factor is that the site is a low point at the zoo, so a large amount of water flows into the area during rain events. This information will need to be taken into account when designing drainage and stormwater management for the site as water would be a larger issue within any proposed exhibits and pedestrian walkways than it is on the current parking lot.

The activities that go on in and around the site were my next focus. Immediately to the west of the site is the zoo’s primary plant nursery. I worked on plans with the zoo during my internship to double the size of the nursery in the next year, which will cut into the existing parking lot and the available exhibit space. The nursery also involves the occasional use of loud machinery and large deliveries and pickups. I will need to accommodate
for the spacial needs of the expansion and equipment.

The road that currently goes through the site acts as an access to offices and the zoo's animal hospital. Thus far, I have not received a definitive answer from the zoo as to whether or not the road must be present after the South America project is complete. Although the road has a secondary access, delivery trucks have no place to turn around, and therefore need a second entrance to act as an exit. If the road must remain, it will be rerouted around the exhibits, cutting the total usable space down to about 2.2 acres. This would yield a space that could hold about 4 or 5 major exhibits, plus smaller attractions. In addition, if the road is left on site, sound barriers will be needed to keep road noise out of the exhibit space. If the road were to be removed entirely, it would leave 3 acres of space, enough room for about 6 or 7 major exhibits.

Pedestrian circulation was also an important area of study, as linking the new exhibits to the existing zoo will need to be done in a way that attracts visitors. On the southern side of the site (northern edge of the zoo) is a large picnic and pavilion area where school field trips have lunch and other events take place. There is also a secondary zoo entrance. When the parking lot is removed from the site, this will no longer act as an entrance to the zoo, but it is still a major path that could act as a gateway or entrance into the South American exhibits. However, the picnic and pavilion area will probably need to be altered or reworked to create a better circulation pattern in and out of the site. One opportunity to improve the existing zoo is connecting the South American exhibits to the nearby CREW (Center for Conservation and Research of Endangered Wildlife) building, a rather unvisited exhibit because of its "out of the way" location. By connecting CREW with the new South American exhibits, it would bring it more into the primary pedestrian fold.

I have conducted a Cincinnati Zoo visitor survey, asking which of the zoo's existing exhibits were their favorites, and which were their least favorites. I can use the answers that I gathered to understand what types of exhibits and qualities that the visitors are attracted to. Likewise, I will also be able to determine which types of exhibits and qualities that visitors are turned off by. The most common answers for the visitors' favorite exhibits were:
Lion Exhibit

The Cincinnati Zoo’s lion exhibit offers two key qualities that are not common among other exhibits at the zoo. The first is that it offers a nearly 360 degree viewing opportunity. While 360 degree viewing offers some design challenges, it is can make an exhibit very immersive as visitors can visually and physically explore all parts of the enclosure. The second quality of the Lion exhibit that makes it a visitor favorite is the fact that the lions are at eye level with the viewers. This creates an excitement (brought on through a fear emotion) in the visitor which results in a greater respect for the animal, as opposed to looking down at an animal in an enclosure, which causes the human to feel superior.

Jungle Trails

Jungle trails is a popular favorite among visitors because it offers the experience of a real jungle. This zone of the Cincinnati Zoo consists of a dirt path winding through a “jungle” (made from native trees and bamboo plantings). As the visitors make turns through the dense vegetation, exhibits holding primates from either Africa or Asia come into view. Jungle Trails uses the idea of creating a convincing landscape both inside and outside of the
exhibits to make the visitors feel as though they are a part of the animal's space. Also, visual isolation causes the visitor to believe they are in a real jungle.

**Leaf-Cutter Ant Exhibit**

The Leaf-Cutter Ant Exhibit was also a very popular favorite because of its strong interactive qualities. The exhibit consists of two chambers— one containing leaves and the other containing the ant colony. The two chambers, across the building from each other, are connected with clear tubes, which allow visitors to view a constant stream of ants carrying leaf pieces to their colony. The exhibit includes various interactive stations, such as one where visitors can try and count the ants that pass through the tube. This exhibit is successful because it gives the visitor's a unique view of an unfamiliar animal and makes them excited about the creatures.

**Cheetah Presentation**

While the cheetah presentation is not a full time exhibit (the cheetah exhibit is separate), it is very successful in showing visitor's a natural behavior of the animal. In the presentation, viewers are able to see cheetahs sprinting at their full speed of 60-70 mph. This is an incredible sight that humans could typically only see in the wild. It is a unique experience that again gives the visitors a great respect for the animal which can be very effective in encouraging education on conservation matters.
The most common answers for the visitors' least favorite exhibits were:

**Reptile House**

The Reptile House at the Cincinnati Zoo is the oldest zoological building in the United States, dating back to 1875. This is most likely the reason why it is one of the least favorite exhibits at the zoo, as it is using outdated techniques. Although it is a fantastic architectural specimen, the building is small and has little to offer as far as innovative exhibits or viewing opportunities. Exhibits are very straightforward, consisting of boxes set into the walls with glass fronts. The Reptile House holds snakes, turtles, and lizards from around the world.

**Bear Exhibits**

The two bear exhibits of the American Black Bear and the Spectacled Bear are very small and unnatural. They consist of a mote separating the exhibit from the viewers and three sides of fake rockwork that form the enclosure. Also in the exhibit are small pools and fake logs. As a result, the bears spend most of their time sleeping rather than engaging in any natural behaviors. The unrealistic nature of the exhibits destroys the "wild illusion" that a zoo tries to create for its visitors and reminds them that they are in fact in a zoo and not in the wild.

**Wildlife Canyon**

Wildlife Canyon is very similar to the bear exhibits in that it offers a row of exhibits, all viewable from one side. Fake rockwork and visible chain link fences divide the exhibits. Within the exhibits, there is little more than a pile of hay for the camel, river hogs, and other animals. Similar to the bear exhibits, the lack of realism ruins the illusion for the viewers.
"The love for all living creatures is the most noble attribute of man."

-Charles Darwin
My vision for the Cincinnati Zoo's South American Exhibit is to paint a full picture of the South American continent for the Zoo's visitors. This includes exhibiting all of the major biomes and animals that will bring the visitors into the South American environment. By using native plants that replicate the feeling of each biome and manipulating topography and creating certain views, combined with exhibiting animals and providing educational opportunities about the continent's culture and history, people can come away with a full understanding.

The individual exhibits will be created to match as closely to the actual habitats of the animals as possible. Behavioral enrichment stimulants within the exhibits will also allow animals to exhibit their natural behaviors and visitors will have unique, interesting, educational, and entertaining viewing opportunities of these exhibits. By providing fully for both the animals and the visitors, a successful and educationally and entertainingly valuable exhibit can be achieved.
Overarching Goal:
Create a successful South American exhibit for the Cincinnati Zoo

1. Create a better environment for domesticated/captured animals to live in.
   a. Allow the exhibit’s animals to display natural behaviors
      i. Use native vegetation that replicates those found in their natural habitat
         ii. Use realistic topography
         iii. Design unique opportunities for the animals to exhibit their natural behaviors
         iv. Create large enough exhibits for the animals to properly perform natural behaviors
         v. Do not allow visitor viewing platforms to become too invasive
   b. Provide ample holding facilities
      i. Provide a holding facility for each exhibit
      ii. Provide emergency vehicle access to each holding facility

2. Design a successfully immersive and educational exhibit for the visitors.
   a. Provide interesting, educational, and entertaining viewing opportunities
      i. Provide interesting viewing angles
      ii. Bring visitors to appropriate elevations for viewing each specific animal
   b. Provide equal experiences for all guests
      i. Make all paths, ramps, facilities, etc. ADA compliant
      ii. Ensure all viewing/signage is accessible from a child’s height
   c. Educate visitors
      i. Provide educational signage about each animal and habitat
      ii. Provide educational interactive experiences that conform to the Cincinnati Zoo’s message of conservation, respect for animals, and sustainability
   d. Immerse the visitors in a South American experience
      i. Use proper vegetation and landscapes in and out of exhibits
      ii. Use screening to block unwanted views
“Any glimpse into the life of an animal quickens our own and makes it so much the larger and better in every way.”

-Ansel Adams
DESIGN
PROCESS
Vicinity Map

The Cincinnati Zoo and Botanical Garden lies three miles north of downtown Cincinnati and just blocks from the University of Cincinnati campus.
Zoo Map
Zoo Circulation

The Cincinnati Zoo’s campus is organized around a main loop path, with the main entrance on the southern edge of the site. This is the primary circulatory path for visitors to move about the park. Branching off of the main loop are numerous exhibit loops, which take visitors through a particular themed area of exhibits before returning them to the main loop.

There also exist several non-loop paths that aid visitors in moving about the park and reaching certain exhibits. In addition, there is a scenic train loop at the center of the Zoo’s campus.
Site Boundary

The site available for the South American Exhibit is located on the northern edge of the Cincinnati Zoo’s property. The last remaining onsite parking lot makes up the bulk of the site, at roughly three acres. There are also opportunities to extend the site south, into the Zoo’s main campus to connect with the Main Loop.

Site Circulation

The site is cut off from the rest of the Zoo by an access road, the entrance of which is on Forest Avenue. The road then stretches down the western spine of the Zoo and acts as an access to several exhibits, warehouse storage, and maintenance areas.

Site Attractions

There are many existing attractions in the vicinity of the site, including food and restroom facilities, indoor exhibits, outdoor exhibits, and even a merry-go-round and theater. Outdoor exhibits include the White Lion, Rhinos, and Ring Tailed Lemur. Indoor exhibits include Manatee Springs and the CREW center. These existing attractions already bring a steady flow of visitors into the area.

Tree Cover

North of the site is a thick, mature tree forest, which would act as an excellent existing backdrop for many of the exhibits. There are also several mature trees between the site and the existing zoo. However, there are unscreened buildings, most notably the Animal Hospital.

Service Area

The Cincinnati Zoo has several service areas that are not open to the public. These spaces include service roads and paths, maintenance and animal care facilities, and office space.

Site Topography

The site has a general northward slope, excluding the pavement of the parking lot. There is also a small ravine to the south of the site with major topographical changes. In addition, the steep slope north of Manatee Springs has caused erosion issues for the Zoo.
Combined Inventory
Current Site Conditions
1. Main Loop Access
   Being cut off from the rest of the Zoo’s circulation by the picnic area and Manatee Springs, providing the site with access from the Main Loop will greatly improve its visibility to the visitors. Currently there is a path that extends from the parking lot, runs adjacent to Manatee Springs, and connects to the Main Loop. Although part of this stretch is currently a service path, the path would be a perfect main entrance to the South American exhibit.

2. Erosion Control
   The Zoo is currently experiencing erosion issues on the steep slope north of Manatee Springs. This could be remediated through either vegetative or structural measures.

3. Topography
   On the southern edge of the site exists a small ravine with a fifteen foot change in elevation. This area would lend itself well to a mountainous exhibit. Being adjacent to the Animal Hospital however would require screening.

4. Service Drive
   Duluth Avenue, which extends south from Forest Avenue, is a great opportunity for a rerouted service drive. This would eliminate the need for the current service drive that cuts the site off from the rest of the Zoo.

5. Parking Lot
   The majority of the site is currently a parking lot. Although this creates a “blank slate” to work with, it also offers no natural topography to work with in the recreation of South America’s varied habitats. This requires significant earthwork if any topographical changes are to be made.
Combined Analysis
Concept 2 expands on the "exhibits in the round," making each exhibit accessible from a central location. This separates the exhibits and allows each to have its own environment.

Circulatory Concept 1

(Left)

Circulatory Concept 1 looks at the possibilities of "exhibits in the round." In this circulatory organization, visitors can view all exhibits from a single, central location. This has the effect of making the visitors feel as though they are in the midst of the habitats. Also, it gives them the freedom to easily view the exhibits multiple times and in any order.

(right)

Circulatory Concept 2