Historic Zoo Architecture: 
Creating New Meaning

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"The art and science of exhibit design relies on illusions to attract the visitor's attention, instill a memorable impression, promote an enjoyable experience, and convey a clear educational message" Kenneth J. Polakowski, *Zoo Design: The Reality of Wild Illusions*, 1987.
A charming, delicate, elderly woman was particularly elegant about the use of the English language. When she and her husband were planning a trip to Florida, she wrote to a campground to seek a reservation. She wanted to be certain the campground was completely equipped, but she didn’t quite know how to ask about the toilet facilities. She couldn't bring herself to write the word “toilet” in her letter. She thought about how to ask the campground manager about the availability of “facilities” for some time before she decided to use the words “bathroom commode.” But, because she was so elegant and so determined not to embarrass the manager, she wrote and asked if the campground had its own “B.C.”

The manager received her letter, which left him totally confused. He asked everyone he knew if they understood the B.C. abbreviation. Finally, he decided the abbreviation stood for “Baptist Church,” and he promptly wrote the woman this reply:

Dear Madam:

I regret very much the delay in answering your letter, but I now take the pleasure of informing you that a B.C. is located nine miles north of the campground and is capable of seating 250 people at one time.

I admit it is quite a distance away if you are in the habit of going regularly, but I don’t doubt you will be pleased to know that a great number of people take their lunches along and make a day of it. They usually arrive early and stay late.

The last time my wife and I went was six years ago, and it was so crowded we had to stand up the whole time we were there. It may interest you to know that right now there is a supper planned to raise money to buy more seats. They’re going to hold it in the basement of the B.C.

I would like to say it pains me very much not to be able to go more regularly, but it surely is not from lack of desire on my part.

As we grow older, it seems to be more and more of an effort, particularly in cold weather.

If you decide to come down to the campground, perhaps I could go with you the first time you go, sit with you, and introduce you to all the other folks. Remember, this is a friendly community!

Sincerely

John White

--From http://home.earthlink.net/~jpark1/funny/jokes/j-wrd-27.html

Miscommunication, whether between two people or between a facility and its masses of visitors, is a very important issue in zoo design today. Zoo professionals strive to educate the public on the ideals of conservation. Using exhibit design and intricate interpretives and signage, zoos attempt to educate while entertaining. In many cases, zoo professionals and designers overlook the contextual clues we unknowingly pass onto visitors. Sometimes our
biases blind us to details that may affect how visitors receive the conservation message we are trying to pass on.

To further complicate things, zoos today are oftentimes utilizing exhibits that are old and outdated. With over 100 zoos in the United States having opened over 50 years ago, a good number of exhibits in use today are outdated (Kisling, Jr., 2001). These exhibits can carry more obvious contradictory clues to the conservation message, and create a situation in which visitors walk away not understanding the message and even worse, having negative feelings toward the animal or zoo. Exhibits that are dominated by human forces, such as art and architecture, may oppose conservation and preservation ideals creating an ambiguous meaning for visitors. Art and architecture are human centered activities that can create the subliminal message “We are more important than wildlife and nature”.

In this day and age, a great many zoos are considered historic, sustaining historic structures, and limited in space by urban situations. Zoo designers are facing the challenge of not only increasing the quality and level of communication of zoo messages but also reusing these historic structures in a way that allows clear positive meaning for visitors. The question now is: Can this be done?

Hypothesis

In order to affect the way society views the environment and wildlife, zoos have to understand how everything they do affects visitors. In addition, the increasing urban environment has begun to limit expansion of older zoos, causing a need for rehabilitation of existing structures, including those deemed historic. Therefore, to encourage the advancement of zoo design and planning, we must begin to understand the relationship of these structures to new design trends.
Historic zoo architecture can be integrated into modern exhibitry practices to create a hybrid style that communicates a positive conservation message and conveys unambiguous meaning to visitors.

Historic Zoo Architecture

Although this may seem straightforward, the term “historic zoo architecture” needs to be defined. For the purpose of this project, “historic zoo architecture” indicates a structure or building that is fifty or more years old. Fifty years is the standard used throughout the United States for consideration for the National Register of Historic Places. Historic zoo architecture, in this project, includes only exhibitry buildings, such as the Small Mammal House at the Philadelphia Zoo. Although, other structures, such as administration buildings, carousels, or entrance gates, may be older than fifty years, we are looking specifically at buildings that originally held animals for display. This indicates a specific animal-related function and meaning of the structure.

Small mammal house at the Philadelphia Zoo.

Once a zoo structure is identified as historic, we need to consider other characteristics before deciding to rehabilitate it for reuse in a modern way. According to the Secretary of the Interior, historic buildings should be evaluated on their relative importance in history, in this case, zoo history, its physical condition, its proposed use, and the mandated code requirements (p. 1, 1995). All of the historic zoo architecture examined in this project will have passed these evaluations.

What is the importance of saving these structures? Like any piece of antiquity, it illustrates our history, whether good or bad. Its value is in its being, just like an animal or
plant. Not only can we learn about ourselves by examining an historic zoo structure, but we can easily see how far we have come and can learn from past mistakes. Many times these structures have high aesthetic value as well, having been built with extraordinary care and intricacy. Each structure must be evaluated for its value to the zoo world, but we must remember that like an historic house, much of its value is simply inherent.

Modern Exhibitry Practices

The trend of today’s zoo exhibits follows the idea that the zoo has the unique position of recreational, scientific, and educational facility. Exhibits tend to maximize educational and recreational potential by providing exhaustive interpretives, vivid landscapes, close encounters with animals, and imaginative storylines. Zoo designers understand that there is no one prescriptive exhibit style for every new exhibit, but most are trying to incorporate the principles of landscape immersion exhibits. This style, conceived by Jones, Coe, Hancocks, and Paulson in the 1970s, attempts to recreate the animals’ natural habitat on a miniature scale, and places the visitor within this habitat (Powell, 1997). The first exhibit that utilized this technique was the Woodland Park Zoo’s Gorilla exhibit in 1979 (Woodland Park Zoo, 2003).
Bronx Zoo’s Jungle World

David Hancocks in front of Woodland Park Zoo’s Gorilla exhibit.

From WPZ website.
Message and Meaning

Message and meaning are two terms that are generally used interchangeably, but have distinct implications in relation to exhibitry. Although many people have defined these terms differently, for the purposes of this project, we will concentrate on the definitions determined by the social sciences. According to Robinson, the message is the verbal communication received by the visitor (1995). This is the intended communication from the zoo; what is written on the signs and the underlying communication used to help define the design. The meaning is then determined by the contextual clues given by the environment plus the message (Robinson, 1995). The meaning is what the visitor interprets from the exhibit, and therefore is what ultimately affects their attitude and educational experience. Context can easily be in contradiction to the message, which can cause visitors to walk away with an unclear meaning. This ambiguity of meaning will undermine the effectiveness of the exhibit. Therefore, a successful exhibit would convey both a positive conservation message and an unambiguous meaning of respect.

Learning is the culmination of perceptions and knowledge. It is assessed by changes in attitude and behavior (Powell, 1969). Therefore, creation of meaning is a form of learning. “Learning…is the means through which we acquire not only skills and knowledge, but values, attitudes, and emotional reactions” (Taylor, 2002). As educators know, people learn by different means: visual clues, reading, hands-on experience, imitation, and so on. Successful learning generally occurs through repetition and utilization of multiple channels of education (Powell, 1969). In assigning meaning to a zoo exhibit, a person can learn through contextual clues of the exhibit, written signage, hands-on interpretives, and docents.
Although several channels of learning are available to a zoo visitor, it is important to remember that successful education depends on the “inclination and ability to receive and to respond” to these education channels (Taylor, 2002). Understanding that visitors may or may not be visiting the zoo with the intention of learning is a first step to more successfully educating the visitors. This means that we must not only provide interesting signage and
interpretes, but we have the daunting task of ensuring that every aspect of the exhibit follows the educational message we are intending to send.
“Concentration on messages, and getting them right, may have obscured the need for trying to assess meanings…Only those species of messages that are effective, as judged by attitude and behavior changes in the recipients, ultimately survive.” Michael H. Robinson, “Zoo and Aquarium Messages, Meanings and Contexts,” 1995, p. 22.

**Historically**


Throughout history, man’s understanding of the environment has evolved to fit both the values of society as well as the scientific or mythical ideas of the time. Zoos are a clear illustration of these changing paradigms. Zoos, not necessarily in the sense of today’s facilities, have been a part of society for well over 5000 years (Kisling, Jr., 2001). And as such, they have evolved as reflections of the time’s philosophy of nature. Therefore, their messages may have changed somewhat, but their meanings would be drastically different over time.

According to Rowan and Hoage, the evolution of the modern zoo can be easily categorized into three main exhibitry philosophies: Zoos as Jails (1865-1900), Zoos as Art Galleries (1900-1950), and Zoos as Conservation and Education Facilities (1950-today) (1995). When compared to values and relationships to nature of these times, a correlation can easily be seen; zoo philosophy is a direct result of societal philosophy toward nature. For example, the mid to late nineteenth century saw the arrival of the early conservation movement, where men began thinking about the usefulness of the world around them. The publication of the theory of evolution was during this time, and a major shift in the scientific
methodologies took place (Rowan and Hoage, 1995). In addition, this was a time when the romantic landscape was popular, and beauty and affluence were highly valued. Zoos during this time, such as the London Zoo, Melbourne Zoo, Philadelphia Zoo, and Cincinnati Zoo to name just a few, were built to display the animals taxonomically to reflect this emerging awareness of the relationships between animal groups, in structures that were ornate and reflective of cultural architectural styles of an animal’s native land (Coe, 1995). Most zoos at this time were laid out on a romantic landscape, with vast lawns for Sunday gatherings, and beautiful gardens for contemplation. The zoo was a place to see and be seen. The zoo reflected the ideals of the time. The messages they sent were ones of scientific understanding, but the meaning they relayed was that of power, dominance, and beauty. Similar relationships between the nature philosophy and zoos can be seen throughout history to modern times.

**Today**

“...Zoo exhibits are serving to focus our collective conscience on the plight of planet Earth and are becoming powerful educational media to this end.” Anne Elizabeth Powell, “Gardens of Eden,” April 1997.

In contrast to the past, today’s society has embraced the principles of ecology and conservation. The general public is knowledgeable about different facets of nature. We are inundated by television shows (and even entire networks), magazines, and books dedicated to animals and nature. The ideas of ecology are taught to students of all ages, and the theory of evolution is widely accepted as truth. Governments and grassroots organizations work to pass legislation to protect animals and habitat, not only for our use and enjoyment, but also for the inherent value these things hold. Our relationship with nature has evolved drastically since the nineteenth century, and our zoos are reflecting this. Today’s zoos generally hold
four tenets as their mission: conservation, education, recreation, and research, and they are reflected in just about all aspects of the zoo. Exhibits are large and open, with vegetation that is representative of an animal’s native habitat. They have a variety of experiences for the animals to engage, and incorporate the idea of stimulating natural behaviors. Exhibits are designed to evoke emotional responses, particularly of awe, and respect for nature and wildlife. Zoos today send specific messages of conservation, including “the fate of the earth, environmental degradation and its cause, the need for conservation and the means of saving species, the importance of zoos to conservation, the need for and importance of zoological/veterinary research, and actions that citizens can take to conserve raw materials, resources and energy” (Robinson, 1995). However, the meanings that visitors take away from these exhibits are, in many cases, not as idealistic as the zoos’ intended.
Education: Docent teaching about poaching at Zoo Atlanta. Photo M. Nichols

Recreation: Family enjoying the zoo at Columbus Zoo. Photo M. Nichols
Even in the best designed zoo exhibits, visitors can still be heard complaining about the size and condition of the habitat, and commenting on how sad an animal may look or feel. Summers states “despite excellent intentions, even the best zoos may be creating animal stereotypes that are not only incorrect, but that actually work against the interests of wildlife preservation…The sight of caged animals does not engender respect for animals” (Coe, 1996).

Although in some exhibits, negative comments are heard far less than exclamations of awe and honest admiration, the meanings taken away from zoos are still far from being the meanings we want visitors to understand. “Just as animals may convey messages by signals that have not evolved specifically for a communicative function so can we design exhibits with intended messages that also convey an unintended [meaning]” (Robinson, 1995).

Add to this situation the use of historic structures, built fifty or more years ago. These structures came from a different zoo era. All of the structures considered historic
would just fall into the category of Zoos as Art Museums and Zoos as Jails. “The evolution of society and the evolution of zoos are inextricably interlinked. Nowadays we are likely to use twentieth-century attitudes to judge nineteenth century zoos, a totally inappropriate context! In their history zoos have passed from possessing few deliberate messages, themselves directed at a minority audience, to institutions that are ostensibly specialized for communicating important messages to a mass audience” (Robinson, 1995).

If our contextual clues were confusing for visitors in new, well-designed exhibits of today, how are they affected by exhibits still utilizing these structures with all of their implied contextual clues pointing to a meaning far different than that intended by today’s zoos? And if these structures come with so many negative or contradictory contextual clues, can we as exhibit designers possibly reuse them in a responsible and meaningful way? Robinson points out that even though today’s zoos have strong messages to convey, they are not “sufficiently sensitive” to the clues leading visitors to contradictory meanings. He points out things as simple as calling animal care staff zookeepers, as if the animals need to be “kept”—guarded or watched, as in imprisonment—referring to animals in zoos as being in “captivity”—which implies being held against your will—or deeming an animal area a “house” (1995). Our use of anthropomorphic terms can easily set the wrong tone for zoo visitors.
Research

Observational Study

In order to clearly understand how exhibits can affect visitors’ perceptions and assignment of meaning to an exhibit, we must first examine how visitors behave in exhibits. To clearly illustrate differences and similarities, we will compare behavior at two differently designed exhibits; one from today’s design practices, one from the era of modernism in the early 1950s. Disney’s Animal Kingdom in Orlando, Florida opened its doors to the public less than five years ago. Its design, like all of Disney’s theme parks, is magical and innovative, creating worlds in which the visitor becomes lost. Rich storylines lead you through different continents and different times, all exquisitely designed down to the smallest detail. In contrast, Philadelphia Zoo’s Cat House, which opened its doors more than fifty years ago, presents a taxonomic collection of cat species from around the world in small, unnatural exhibits. The visitor neither gets lost in the storyline, for which none exists, nor gets feelings of adventure or exploration.

These two starkly different settings create a stage on which to compare how visitors are affected by exhibit design. At each of these facilities, I observed visitor behavior at the tiger exhibits. Both tiger habitats were anchor exhibits for a larger area, Animal Kingdom’s Asian Jungle Trek and Philadelphia Zoo’s Cat House. Visitors moved through each area in order to see the next exhibit. However, the difference does occur in the display style, Animal Kingdom utilized zoogeographic regions (Asia) and Philadelphia Zoo used taxonomic (Felid).

Participant-Observation

To create an illustrative image of what the exhibits are like for visitors, the following descriptions are a result of participant-observation study. The Philadelphia Zoo’s Cat
House Tiger area has both inside and outside viewing. Visited on a cold morning, November 2, 2002, the inside area was warm and comfortable. After opening the glass institutional double doors, the visitor enters a dark room with high ceilings and seating bleachers on the right. The room is silent like a library, with footsteps and voices echoing to you. On your left, a row of steel-barred cages runs the length of the room. The cages, lined with efficient green tiles and concrete, offer no comfort or toy for the animals held captive here. As a visitor, you can walk right up to the cages, bounded by a short railing and about 6 feet between the railing and the cages. The tiger, seeming to stalk the visitor, walks back and forth at the front of the cage, obviously startled at loud noises and quick movements. When the large room is empty, the visitor shares a moment with the huge beautiful beast, but as more people enter, the room becomes nothing more than a circus sideshow, especially when the distressed tiger starts to roar and jump after hearing the sounds of her two cubs outside.
Outside, even in the sun, its chilly with the winter crosswinds. After exiting the building, a walk leads the visitor around a large circular island with a deep empty concrete moat surrounding. The low concrete wall, surrounding the exhibit, topped by a metal railing camouflaged by planting beds offers an excellent viewing platform for small children to be hoisted onto by parents, and the concrete benches located on all sides offers a seating area with a nice background for families eating lunch from the nearby food stand. The rocky island, with the beautiful historic building as a backdrop, offers different levels and interest for the tigers, and they seem happy as they chase each other and play. The visitors seem interested for a short while or as they wait for others to return from the bathroom or restaurant, and children run around chasing birds.
Overall, the tiger exhibit makes no large impression and people seem as interested in it and the tigers as they were for the lions, elephants, and tortoises. Although it was very easy to view the animals, the largely human dominated scene created an environment in which the tiger had no identity. It was neither powerful nor graceful; intimidating nor awe-inspiring; intriguing nor impressive.

Disney’s Animal Kingdom Tiger area is divided into three main viewing areas: Fountain, Temple, and Bridge with two smaller hidden views near the fountain and near the end of the trail in a smaller temple. On a beautiful morning, October 19, 2002, the visitor gains one last glance of the bat exhibit located just prior to the tigers before climbing up the steps to the first viewing platform. The steps are surrounded by intricate architectural masonry leading to an open air patio enclosed by overhead wood beams. Laid out in front of the visitor, is a beautiful fountain overgrown with weeds and spilling over into a wet moat below. Lying in the sun on the fountain wall and playing in the water are tigers. The area is
obviously an abandoned temple and grounds, now overtaken by the native tigers. The whole scene is incredibly beautiful, and encourages exploration to see what is around the corner. Walking down the steps, you can see the tropical forest surrounding the temple. Around the corner away from the traffic, an intricate window reveals a much closer view of the tigers playing there.
Continuing on down the path, the visitor enters into a debilitated temple building with high walls lined with windows looking out onto two different courtyards. The larger is actually the same area with the fountain, but from this view, you can see the vastness that the tigers encompass, with no signs of enclosure aside from the temple’s three walls. Here, the visitor sees several more tigers, hiding in the shade near the window or in the shrubs near the wall. In the smaller courtyard, the tiger walks along the perimeter defined by the temple walls, passing in and out of sight behind trees and shrubs.
Here, many people start to gather, but all focus on the tigers, huddling to see them more closely. Some people talk, but in hushed tones, and others wave to their friends to come see. In this area, the tigers are on the same level as you separated by only a pane of glass; your pulse quickens a bit as you watch intently. For the most part, the visitors are in awe, especially when the tiger, giving in to her instincts, begins chase of a rabbit, catching it and protecting it from the others as she starts chewing on it.

As the visitor continues out of the temple, past the other exhibits of other animals found in Asia, they enter a bridge area with cooling breezes that overlooks both a tiger area and an antelope area. The tiger is separated from the antelope by a shallow fountain moat that seems to allow the tiger quick access to the antelope. Overhead, fabric flags wave and the visitors are separated from the exhibits by meshing. The tiger seems to be enclosed in
the courtyard by the temple walls, and although this area has already been seen, it seems to be another area entirely. It seems the tigers have overrun the entire area!

After crossing the bridge and continuing on the path through the forest to the aviary, visitors are offered one last look at the tiger in the courtyard through a small window tucked into a small temple. This view feels very intimate and is the perfect ending to an amazing experience with the tigers.

Overall, the tiger exhibits are exciting and interesting, leading the visitor along an adventure. Subtle clues about the animal, its native habitat, and the culture of its native land, make learning less of a chore. As you progress through the viewing areas, you are exposed to different conditions: cool, hot, shade, sun, openness, enclosure, intimate and gathering. The Animal Kingdom presented the tiger as powerful, graceful, intimidating, awe-inspiring, intriguing, and impressive.

**Behavior Observation**

Although these biased descriptions can tell us a lot about the quality, strengths, and weaknesses of these exhibits, they do not explain how they actually affect visitors who are
not attempting to pay attention to these subtle characteristics. On the same days, I spent several hours observing visitor behavior to understand any differences or similarities between the visitors at each of these exhibits. Comparing the results will indicate general trends of zoo and theme park visitors, and how exhibit design may affect visitors’ behaviors and outward attitudes (as illustrated through two extremely contrasting designs). In general both exhibits saw more visitors in the afternoon than in the morning, and on these particular days, Philadelphia saw much less visitor volume than did Animal Kingdom.

After breaking down the entire exhibit into smaller observation areas and spending approximately four hours observing visitor behavior at each exhibit, generalized categories were devised into which each of the visitor behaviors were placed. From these categories, some surprising results occurred in terms of averages (See Appendix A for all data charts). Overall, visitors that come to zoos and theme parks spend an average of 90 seconds per viewing area. This is surprising, since many of us in design believe that a more appealing design will compel people to spend more time enjoying it. However, both exhibits showed a similar amount of time spent, with the Philadelphia Zoo actually showing visitors spending slightly longer at each viewing area. In addition, the ratio of adults to children at both sites was approximately 70 percent adults to 30 percent children. Again, this is surprising, since most zoos and theme parks are designed with children in mind, especially in terms of educational interpretives. One final similarity found from this study simply indicates that people come to zoos to see animals. Both of the sites had in their top five behaviors exhibited by visitors “talk and watch” and “watch quietly.”

However, the similarities between these two sites end here. After having categorized each of the behaviors, they were then determined to be either “positive,” “negative,” or “neutral” based on the attitudes these behaviors may reflect. For example, taking a picture
or videotaping can be considered positive since it indicates an interest in the exhibit or animal, while walking by only looking quickly would be considered negative, as it illustrates that visitor interest was not piqued by the exhibit or animal. Although some of these actions may be taken out of context or misconstrued, it is still a good reflection of the general resultant attitudes from the exhibit context, which are influential on the meaning taken from the exhibit. (See list of categorized behaviors, Appendix B).

Sign asking visitors to behave (below).

In comparing the two sites, we can easily see how their designs affect outward visitor behavior. Overall, Animal Kingdom visitors displayed less negative behaviors than Philadelphia Zoo visitors. Specifically, Animal Kingdom visitors showed (of positive and negative behaviors) approximately 80 percent positive to 20 percent negative, while Philadelphia Zoo showed approximately a 50 percent split (Figures 1 and 2). In addition, of the top five behaviors exhibited by visitors at Philadelphia, two can be categorized as negative and one as positive. In contrast, Animal Kingdom’s top five included three categorized as positive and one as negative.
Comparison of Observed "Positive" Behaviors and "Negative" Behaviors at Disney's Animal Kingdom Asian Tiger Exhibit

Positive Behaviors 79%
Negative Behaviors 21%

Figure 1

Positive and Negative Visitor Behavior at Philadelphia Zoo's Carnivora House Tiger Exhibit

Positive Behavior 52%
Negative Behavior 48%

Figure 2
Furthermore, visitors exhibited exclamations of awe (such as “wow,” “oooh,” “aaaah”) only one percent of the time and bad behaviors (such as yelling, whistling, making cat sounds, saying “here kitty-kitty”) 13 percent of the time at Philadelphia Zoo, while at Animal Kingdom visitors exhibited these behaviors five percent and two percent of the time, respectively (Figures 3 and 4). Interestingly, however, more people were heard talking about tigers at Philadelphia Zoo than at Animal Kingdom, which either reflects that visitors’ curiosity was sparked more at Philadelphia or that conditions were better for overhearing such conversations at Philadelphia than at Animal Kingdom.

![Behaviors of Visitors at Disney’s Animal Kingdom Asian Tiger Exhibit](image-url)

Figure 3
Overall, these observations show us several important ideas to consider when designing an exhibit. First, despite the intricacy of the exhibit, visitors will stay and observe for only 90 seconds. This is a very short amount of time in which to communicate a message and influence a meaning for the exhibit. Second, visitors go to the zoo to see animals. They may or may not want to read signs, and they are more likely to ignore signs than to ignore animals. Third, communication of ideas should not be aimed at only children. The vast majority of visitors in these studies were adults accompanying children. Aiming education at adults as well as children may increase learning since adults influence what children learn and attitudes that they acquire. Fourth, older, less intricate and non-immersion style exhibits encourage negative behaviors, and therefore, negative associated meanings.

**Case Study**

Understanding how visitors are affected by exhibit design tells us only so much. The next step in examining the relationship between historic architecture, modern exhibitry, and
the meaning of the exhibit requires a thorough investigation into an example of zoo architectural rehabilitation and exhibit renovation. In this case study, we will investigate the success of the Cincinnati Zoo’s Vanishing Giants exhibit, featuring elephants, giraffes, and okapi, in reference to its reuse of the historic structure, its intended message, and the meaning created.

The Cincinnati Zoo is the third oldest zoo in America, having opened its doors in 1875, and is now recognized as a National Historic Landmark. The zoo opened after having spent over $120,000 on buildings and pathways using the picturesque buildings as focal points in the landscape (Ehrlinger, 1993). As its popularity increased, the zoo continued opening new exhibits. In 1906, the Elephant House (originally called the Herbivora House) opened at the cost of $50,000. It was designed to be seen from the street outside the zoo, and was reflective of the Islamic Taj Mahal (Ehrlinger, 1993). At the time it was touted as the “largest and most complete concrete animal building in the world,” and is today considered to be one of the most grand buildings in the zoo world (Ehrlinger, 1993, p. 41). The building is listed on the National Register of Historic Places.
The building has been through many phases of renewal. In 1964, the Elephant House was renovated for the first time. In 1971, additions were made to the outdoor exhibits of the Elephant House including rockwork and a pool. Again, in 1982, it went under major renovation. Finally, in 2000, the Elephant House went under its most recent renovation into the exhibit area now called “Vanishing Giants.”
The new design, a collaborative effort between zoo staff and architect McCollow & Associates, created 24,000 square feet of outdoor exhibit space including 6300 square feet of okapi space and 9000 square feet of Maasai giraffe space, added a 60,000 gallon pond for elephants, and reconfigured the interior of the building to allow four times more space for animals (American Zoo and Aquarium Association, 2000). The newly renovated building now allows indoor exhibit space for both the Asian elephants on one side and the giraffe and okapi on the other. The two sides are divided by animal holding space.
According to Associate Director Jack Huelsman, the design team consisted of Zoo Director Emeritus Ed Maruska, Head Elephant Zookeeper Cecil Jackson, former Education Director Thayne Maynard, Education Director David Jenike, architect Mark McCullow and engineer Ron Heile, and was formed after numerous complaints from visitors about conditions of the house and a recommendation by the American Zoo and Aquarium Association to add a containment device to protect employees were given to the Board of Directors. This team defined the goals of the renovation to be to “create a safer more
efficient work space for the employees, create a healthier environment for the animals and a more spacious and naturalistic outdoor space for the visitor enjoyment” (Huelsman, November 18, 2002). The renovation took 18 months from inception to completion. The team has encountered only one major problem with the design process; the design will have to be reconsidered and modified as the young bull elephant grows.

As part of the design process, the education department was enlisted to create a storyline and thus a message for the exhibit area. They decided to use 12 interpretive panels as well as interactives, discovery cart, and docents to convey their message of human-animal relationship and conservation (American Zoo and Aquarium Association, 2000).

As one moves through the landscape immersion exhibit, it becomes apparent that this message was not carried throughout the entire area. The meaning I took away from this exhibit was ambiguous and changing as I moved through the area. I understood the strong relationship between man and elephant, as I watched the huge creatures move around their large, lush enclosure with the elephant building as a backdrop. They seemed well cared for, and respected. As I moved into the okapi and giraffe area, I became confused. Why are these animals next to the elephant? What kind of relationship exists between man and these animals? Their spaces seemed to be afterthoughts; merely pens large enough for one or two individuals. Are these animals extra playthings for the Maharaja living in the building? My understanding of the exhibit area was lost, as well as the empathy and respect I was building for the zoo and zoo animals.
The exhibit area message of human-interplay with animals works very well with the historic architecture and Asian elephants. However, the message becomes quite confusing in the giraffe and okapi areas. The idea of human interplay does not exist in these areas, and the connection to Islamic culture doesn’t connect with these animals. In fact, any kind of consistent message for the entire exhibit area cannot be feasible with these animal choices. In addition to the three animal species being from two different continents, okapi and giraffe from Africa and Asian elephants from Asia, they are also from three different habitats: human dominated, rainforest, savanna. Furthermore, the simple message suggested by the title “Vanishing Giants” would be better suited to three species of high endangerment status, instead of just two out of the three. I question the use of Maasai giraffe, when the zoo itself is famous for its breeding efforts with the Sumatran Rhino, a highly endangered species that happens to be from the same continent as the Asian elephant. Therefore, a continuous...
message for the exhibit is unclear, thereby confusing the visitors’ understanding and creating an ambiguous meaning for the entire exhibit area.
The exhibit design, however, is quite nice, allowing large space for animals as well as incredible amounts of vegetation representing the natural habitats of each of the animals. Special detail was paid to all aspects of the visitor areas, including benches, paving, and lighting in the Islamic architectural tradition. However, even these details become confusing as the visitor moves from the Asian to the African area.

Overall, the Vanishing Giants exhibit area demonstrates that although successful integration of rehabilitated structures into modern exhibitry can be done, the relationship between the exhibit design and message must be strong and clear throughout the entire exhibit area in order to convey a specific message to the visitors. The animals will drive the design, and the storyline should communicate the zoo’s message. Conflicting design and message will create a situation in which the message becomes lost on the visitor as in this example. Perhaps a closer relationship between the designers and education department, who are developing the exhibit storyline, would create a much more strongly communicated message and thus meaning.

Repetition is a key element in any design, and especially so in attempts to communicate an educational message. However strong the initial education message, especially in relation to the use of the historic building, the idea must be played continually through the exhibit area in order to clearly relate a message that the visitors understand. The exhibit area had only a few signs related to the message of the human and animal relationship and this message was not seen throughout the entire exhibit area. The idea was
lost in relation to the other animals in this area. Although the exhibit area did utilize several
education channels, with docents, interpretives, and design clues related to the elephants
specifically, these channels did not focus on the exhibit message, and the exhibit lacked the
repetition required to adequately communicate the message. Therefore, the exhibit’s
meaning was ambiguous and contrary to the intended message.
“You can tell the story best by helping people experience what it is like to be in a wild place visiting wild animals. Then people will get the message…Only the emotional side, in the end, has the power to generate changes in behavior.” Jon Charles Coe, quoted in “Gardens of Eden,” April 1997.

Are zoos hopelessly trapped in a cycle of evolving societal changes and miscommunicated meanings? Will we ever be able to lap the nature philosophy held by the public to shape the public’s attitudes instead of simply reflecting them? Most zoo professionals believe, if we are cognizant of the past and aware of the present, resoundingly yes. “A review of the past also reveals that the zoos, menageries, and wildlife parks of antiquity, while in some cases dismal or even abhorrent by current standards, simply reflected wildlife values of their times. Yet, today we are seeing a totally new phenomenon—the second great trend. For the first time zoological parks are intentionally taking the lead, attempting to direct public opinion in ways which benefit wildlife. Zoos which are ignorant of historic trends will continue to lag behind growing public concern with conservation ethics and animal welfare” (Coe, 1995).

This may seem to say that historical aspects of zoos are in direct contradiction to the meaning we are attempting to communicate to visitors. However, it simply illustrates the need to reconsider the reuse of the structure. Is it possible to use the building in a different manner than it was originally intended? For example, the Philadelphia Zoo’s Cat House was and still is used to house various species of felid. It was built in the 1950’s and therefore reflects the modernist style of operational efficiency and animal health. However, it appears to visitors as a prison, complete with iron bars and concrete walls. Could this building possibly be renovated to serve the zoo’s mission today? Of course, but it will take ingenuity and creative thinking to move past the idea that it must stay as a building housing cats.
Would it be possible to reverse the roles of the visitor and animal, having the visitor enclosed in the bars looking out to the animal? Could the building serve an entirely new function, such as administration or interpretive center? Could it be used for a different kind of animal with a well-written storyline? Or is the building simply not worth the effort?

An exciting example of using architecture in new ways occurs also at the Philadelphia Zoo. The 2.5-acre PECO Primate Reserve uses the immersion philosophy to incorporate architecture into a vivid storyline that educates people not only on the primate characteristics, but also on the conservation issues surrounding them (Philadelphia Zoo, 2003). The exhibit is designed to resemble an abandoned timber mill that has been renovated for use as a conservation and research station (Philadelphia Zoo, 2003). Throughout the exhibit, relics from the researchers act as educational guides. The exhibit is special, because it uses architecture as an integral element of the storyline, not just another structure to hide.
If we are to take a lead role in shaping people’s perceptions and values about wildlife and the natural world, then we must understand where we are going and what our philosophy may become. Then we must incorporate these ideas into a zoo exhibit that makes people think. We can use historical structures in new ways to make people question their ideals, and where humanity fits into the entire web of life. Historical structures do not need to be kept as sacred shrines. They can be changed and functions questioned. In order to shape the society’s nature philosophy, we must change our philosophy of exhibit design. Can we push beyond the current exhibitry idea that humans are stewards of land and care for animals and the earth, to begin encouraging a true partnership between our species and the rest of the natural web of life? As designers attempting to change public attitudes, we
must push the limits and we must redefine our relationship with nature, as it has been done so many times in the past 5000 years.
In order to demonstrate that an historic zoo building can be renovated for reuse in an innovative and intriguing manner, a site design must be created. The site used for this illustration is the Elephant House and surrounding exhibits at the National Zoo in Washington, D.C. The zoo, which is free to the public, is administrated by the Smithsonian Institution and is funded by both federal and private funds (approximately 70% federal, 30% private) (Smithsonian Institution, 2002).
Site Analysis

The site analysis revealed that the Elephant House and surrounding exhibits have little needing to be saved. The topography has been reworked for the current exhibits and are thus not reflective of any natural systems. The vegetation is young and insignificant, and the paths need to be clarified for visitor use. The building itself has murals and tiled mosaics worthy of keeping. In general, the Elephant House and surrounding exhibits will allow for complete redesign, preserving only the exterior walls of the building.

History

The American zoo began in the mid-nineteenth century with the opening of the Philadelphia Zoo. Soon after, other zoos began to open. By the early 1880’s, Americans began questioning the value and validity of the zoos in existence. The scientific community decided to create a mission for zoos to “encourage and stimulate human progress, education, and science,” and started to fight for the creation of a national zoo (Kisling, Jr., 2001). Although this fight went without answer from the government, the Smithsonian started a small animal collection for study for taxidermists at the museum (Kisling, Jr., 2001). This collection steadily grew, until finally, the government agreed, as an amendment to another bill, to appropriate funds for a national zoo (Kisling, Jr., 2001).

After the 175-acre site was chosen, Frederick Law Olmsted was hired to plan the zoo along with Samuel Langley, third Secretary of the Smithsonian, and William T. Hornaday, head of the Smithsonian’s vertebrate division at that time (Smithsonian Institution, 2002). Following the English romantic landscape, the zoo was laid out along the land to capture picturesque views and the natural beauty of the site, along with large open lawns for crowds to gather on a Sunday afternoon (Ewing, 1996). The zoo exhibited species of significance native to North America, such as bison and beaver. The zoo opened in 1889 with the purpose of “advancement of science and the instruction and recreation of the people” (Lefkowitz Horowitz, 1996). In 1976, the National Zoological Park was added to the National Register of Historic Places.

The Elephant House was originally slated to be built in the early 1890’s. Designed by William Ralph Emerson, an architect who followed the picturesque movement, the original plans described a long low building with pagoda roof and unadorned windows (Ewing, 1996). Emerson apparently spent more time determining the placement of the building in the landscape than determining the animal needs, because the building met with bitter opposition due to lack of animal space (Ewing, 1996). The building was never built.
The zoo then hired local architects Hornblower and Marshall in the early twentieth century (Ewing, 1996). They designed an elephant house that met the standards for animal care and space, and was eventually built. This building was brick in construction, and had indoor and outdoor paddocks for the elephants. The building construction began in September 1902 and held elephants by March 1903 (Smithsonian Institution, http://www.si.edu/archives/historic/zoo.htm). This building is not in use today.

The Elephant House today.

The Elephant House, as it is known today, was built in the early 1930’s. It has seen no major improvements in its 70 years of existence, and is thus in a state of disrepair. The building reflects the modernist movement in its use of utilitarian holding areas and exhibit spaces. The outdoor paddocks have pools with steps, which look more like a sculptural water feature than for animal use. The house was built for Asian elephants, but now houses both Asian and African species. However, the building itself reflects no specific cultural influences.
Zoo Context

The National Zoo is located in Washington, D.C., the nation’s capitol. The zoo is located as part of the Rock Creek Park in the northwest portion of the city. Its major access roads are from Connecticut Avenue within the Woodley Park neighborhood. Two metro stations are nearby and buses travel by regularly.

Opportunities:
- As part of the Smithsonian Institute and the federal government, the zoo enjoys the status of being the “nation’s zoo” and as such sees increased visitor attendance.
- The location of the zoo allows easy access by tourists.
- Bus access encourages use by school groups.

Constraints:
- Easy access and free admission might encourage unwanted users.

Climate

Washington, DC is a temperate climate experiencing a range of temperatures based on season. The hottest months are June and July with averages around 86 degrees, while the coldest months are December and January with averages around 32 degrees. Wind direction is from the Northwest during winter bringing cold temperatures and low wind chill factors.
During summer the wind is from the south bringing warm air and no cooling. The summer months see an average of 10 hours of sunlight in contrast with the overcast days of winter in which only 1-2 hours of sunlight might be seen. May, July, and August tend to be the rainiest months.

**Opportunities:**
- Although a temperate climate, the winter months are usually warm enough to allow outdoor access for the animals.
- Most months of the year are tolerable to both visitors and animals ensuring higher visitor volume and animals being outdoors.

**Constraints:**
- The extremes of both winter and summer might restrict animal comfort (may need to be indoors or have access to shade and other cooling mechanisms).
- During the winter months, animal viewing occurs mainly indoors.

![Climate data](image)  
Climate data. Copyright Columbus Publishing 2003

**Site Context**

The Elephant House and surrounding outdoor exhibits are a major exhibit area for the zoo. The site is along the north side of the zoo, located along the Olmsted Trail. The main elephant viewing path also runs along the prairie dog, bison, and panda exhibits, as well as the free ranging golden-lion tamarin area. Along the north/northeast side of the exhibit, past the Olmsted Trail is vehicular access and parking. There is a tangle of paths at the western corner of the site.

**Opportunities:**
- There is room to expand the exhibit area into the range of the golden-lion tamarins along the south/southeast side.
- Location along the Olmsted Trail encourages lots of visitor use.
- Location near the parking also encourages lots of visitor use.
- Proximity to a restaurant and bathrooms also encourages visitor use.

**Constraints:**
- Parking lot and vehicular road is distracting and may affect animals and visitor viewing.
- Distraction from nearby animal exhibits.
- Nearby animal exhibits follow no clear pattern (no relation to each other or elephant house).

Site analysis drawing: Site context in zoo; Red is site, orange is animal exhibits, blue is pedestrian path, green is vehicular access and parking.

View from elephant path into panda exhibit area.
Water

All bodies of water on site are artificial, concrete bottomed pools for animals. Each pool is no more than 4 feet deep and are gently sloping for the animals to climb into and out of. Most of the run-off flows off-site either along the paved paths to storm water drains or off side-slopes of vegetation. Within the rhinoceros exhibit, water runs into a low point just outside the pool which creates an area of mud for the animal to roll in.

Opportunities:
- Site is graded to prevent flooding and limited erosion.
- Mud area for rhino is good for behavior.
- Lots of pools allow animals to cool off in summer.

Constraints:
- Pools are out-of-date and should be replaced.
Site analysis drawing: Water run-off and man-made pool; light blue is manmade, arrows indicate direction of flow.

Pool in rhino exhibit.
**Pedestrian Paths**

The path for the exhibit takes visitors along the perimeter of the elephant area and into the House. The path is shared on the western side of the exhibit area with other exhibits. The majority of the path is paved in asphalt, while the rest is brick pavers. The zoo’s major artery, Olmsted Trail, runs along the northeastern edge of the site.

**Opportunities:**
- The path is clearly defined and allows visitors to take a direct route around the exhibit area seeing all of the animals.
- The paths are wide enough for people to stand and watch the animals while allowing other visitors to pass.

**Constraints:**
- The paths do not encourage visitor *interaction* with animals—distance people from animals. Obviously at zoo!
- The paths become ambiguous at western side where several meet and other exhibits use the same path.
- Mixture of paving does not distinguish the elephant house path.
- Extremely wide paving at entrance and exit of house is somewhat overwhelming.

Site analysis drawing: paving and pedestrian paths; brown in asphalt, pink is brick paving of Olmsted Path.
Paths within the exhibit area are asphalt while the Olmsted Loop is paved with bricks.

Visitor Amenities

There are 40 benches located in the immediate vicinity of the elephant house area. Most are clustered together in groups of about 10. These benches are movable. There are 30 interpretive signs and approximately 3 directional signs throughout the outdoor exhibit area. A videocamera is located in the elephant yard and inside the house for live streaming of the elephants on the National Zoo’s website.

Opportunities:

- Lots of movable benches encourage visitors to stop and stay awhile.
- Many signs are helpful for visitor education.

Constraints:

- Current arrangement of benches do not reflect good views.
- Signs are small and limited in attractiveness for visitors
Site analysis drawing: visitor amenities; red dots are signs, brown dashes are benches.

Typical sign placement at the zoo.
Vegetation

The site is well-vegetated with a variety of native and ornamental plants ranging in size from groundcover to large, mature trees. The majority of shrub-like plants are varieties of bamboo, particularly the very tall slender black bamboo. Even in winter, there is much vegetation. However, in the warmer months, the ground becomes covered in grasses, which die over winter.

Opportunities:
- The large amount of vegetation present provides some shade during summer for animals and visitors.
- The vegetation is aesthetically pleasing.
- The bamboo is culturally relevant to the Asian species exhibited here.
- The limited number of mature trees enables excavation without having to worry about saving large trees.

Constraints:
- Several large trees might need to be saved.
- More planting will have to be done in the animal areas dependent on the species.
- New plantings must be installed relevant to the animal species.
Plantings at entrance of building.

Typical plantings around exhibits including mature maple tree.
Viewing Areas

The majority of the site is visually available from many vantage points. Some views are blocked by large plantings of bamboo. Almost any point along the path could be a viewing area, and these views generally extend across several animal areas. Inside the house, all animal holding and keeper work areas are visible.

Opportunities:
- Open viewing deters large gatherings of people.
- Animal views are available all along path.
- Visitors learn about keeper duties and animal holding.

Constraints:
- Open views cause the visitor to become blatantly aware of the animal’s enclosure (aware of zoo environment).
- All aspects of the enclosure become visible—moats, fences, doors into house.
- Inside house, all keeper interaction is viewed—no hidden areas for dealing with sick animals, etc.
- Open views cause feelings of dominance and limit the visitor’s interest in learning about the animal or engendering respect.
Site analysis drawing: clear viewing areas (yellow) and views blocked by vegetation (red).

Typical clear viewing area with barriers painfully visible.
View into rhino habitat; can see into interior holding through door.

Viewing into giraffe area.
Slope

The site is gently sloping with small areas of steep slope. Most of the site is between 2 and 8 percent grade, with only one small area having less than 2%. The majority of steep slopes occur in moats or along the outside of the viewing areas. The site is essentially a plateau gently sloping down toward the south with steep side slopes.

**Opportunities:**

- The gentle sloping requires little excavation to meet ADA regulations.
- The sloping terrain adds some interest throughout the site.
- Most viewing occurs from below the animals, which is considered to elicit less feeling of dominance from visitors.

**Constraints:**

- Expansion of the site would require major excavation along the western and southern edges.
- Removal of moats will require addition of earth.

[Site analysis drawing: slope; brown areas are slopes over 8 percent, pink are under 2 percent, red is between 2 and 8 percent.]

Current Animals

The elephant house area currently houses 10 individual very large animals of 4 different species: 2 giraffe (reticulated and Masai), 2 Nile hippos, 2 greater Indian rhino, 4 Asian elephant. The smaller exhibits are currently empty. The zoo plans on moving the elephants to a new larger house.

**Opportunities:**
The site can handle animals large in size as well as hold many individuals.

The plan to move the elephants and perhaps the other animals allows programming for any species that may seem to fit.

**Constraints:**
- The site is not designed to hold small species such as birds or small mammals.

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**Exhibit Conditions**

The National Zoo is undergoing a new masterplanning process. One of their analyses of the zoo included addressing the condition of the exhibits throughout the zoo. The Elephant House area has been identified as “failing”.

**Opportunities:**
- Elephant house area is deemed in poor condition by the zoo. Thus providing the platform for change.
- The majority of the National Zoo is in condition to be
revamped thus providing an opportunity for new ideas and innovative design to be implemented.

Constraints:
- Poor condition means lots of work needs to be done.
- The building itself may be dilapidated and in need of major structural work.

Load Bearing Elements
The interior of the Elephant House is generally open with continuous space throughout. Several small walls exist as barriers between the different animal holding areas. These walls do not bear load. However, some of the exterior walls on the building may be integral load bearing members. In addition, the House has fourteen columns laid out on a grid which also serve as load bearing elements.

Opportunities:
- Fewer essential walls means more freedom for redesigning the interior.

Constraints:
- The design must somehow incorporate the columns and exterior walls in order to maintain the integrity of the building.

Site analysis drawing: Load bearing elements (orange).
Interior Use

The Elephant House is currently used to both hold and exhibit animals. Because of the cold winters, many of the animals require a warm habitat to access when it is frigid. The National Zoo is open year round, and thus it is necessary to view animals while they are indoors. The Elephant House’s animal holding is all on-exhibit; visitors enter through the main doors and are surrounded by holding which they may view. There are a few small areas within the house that are off-exhibit, but they are spaces for zookeepers and volunteers.

Opportunities:
- Open floor plan allows for greater design flexibility
- Lots of animal holding areas already built
- Lots of access doors to outdoor spaces

Constraints:
- Current animal holding is unattractive and depressing
Site analysis drawing: Interior use of building; yellow is visitor area, pink is keeper space and brown is holding.

Interior space with open views, visitor space, keeper area along sides, and outer ring of holding areas.
Experiential

The elephant house generally feels quite old and depressing. The animals seem to be caged and unhappy. The elephant house especially is depressing because of the steel bars and concrete floors (which are good for keepers and health of animals, but not for conscience of visitor). Most of the site is quite loud from the neighboring exhibits’ visitors and from the vehicle areas near the exhibit areas. Several areas along the paths and throughout the house are confusing and can get quite crowded (depending on time of day and season). There are a few spots along the path that seem a bit more intimate, because of greater enclosure from vegetation. These spots are more comfortable for viewing the animals. Several interesting views exist across the site:

1. clear view of rhino pool and the entire exhibit up the hill; somewhat limited exposure to other viewing areas;
2. clear view across a smaller rhino area into the rhino house; can see what is going on inside the animals’ indoor holding areas; intimate viewing area that makes it feel like you are sneaking a look;
3. clear view across elephant yard and into giraffe yard; can also see into elephant holding area inside house;
4. unintentional viewing area between trees along Olmsted Trail into giraffe yard and across to elephant yard; this view is at a higher elevation so is a vista, but from a hidden place.

Opportunities:
• Variety of experiences across site can be easily enhanced to increase the excitement of the exhibit area.

• Much of the site offers few quality experiences and no unique experience, so don’t need to save many areas or experiences.

**Constraints:**

• Dismal house must be revamped almost entirely, but will be difficult within the historic preservation rules.

• Most, if not all, of the outdoor exhibits need to be redesigned.

• The uninspired views do not engender respect for animals nor do they encourage education.

1. Rhino area

2. Small Rhino area
3. Views across both elephant and giraffe areas

4. Unintentional viewing of giraffes
Site Design

The redesign of the Elephant House and surrounding exhibits must incorporate the ideas collected from the research phase of this project. First, the message must be outlined specifically before the design begins. Second, a storyline (concept) must be developed which will incorporate both the architecture of the building and the idea of the message. Finally, the design must relate environmentally, historically, and culturally to the storyline in every aspect while creating healthy and respectful habitats for the animals and exciting visitor and viewing areas.

Storyline Development

The message of the exhibit area will revolve around teaching conservation ideals, methods in use for conservation, and shaping the future nature philosophy. The storyline must adhere to the development of a clear meaning by supporting the message—conservation of habitats and the philosophy of animals as equals.

The Elephant House specifically is the driving force and inspiration behind the storyline development. The architecture must be incorporated fully into the exhibit experience, becoming an integral piece of the storyline. The first step of storyline development here is to associate a culture with the existing architecture. After comparing it to many cultures architectural pieces, I found that the House most resembled a Mexican Colonial period building.
The second step is to associate the building in Mexican Colonial style to a habitat and ecosystem. Rainforest habitat is one of the most endangered habitats in the world. The Mexican rainforests are no different, suffering from the pressures of deforestation from logging and agriculture. Although the habitat that is generally associated with Mexico is arid land and desert, rainforest is particularly relevant due to its identification as “special concern.”

The third step is to identify the specific region in Mexico this place will be representing. The Lacandon Jungle, in the southeast region of Mexico, in the state of Chiapas, is notable for its Montes Azules Biosphere Reserve. This reserve is important as a means of preservation of the rainforest against deforestation. The Lacandon Jungle is one of the most diverse areas in Mexico, and under current pressures, may disappear in as little as 20 years (San Diego Union-Tribune, 2001). Since 1970, the Lacandon Jungle has dwindled from 3.5 million acres to 1.6 million acres (San Diego Union-Tribune, 2001). Using this rainforest as a setting for the building will encourage teaching of conservation issues.
The final step in developing the storyline begs the question, How did this building come to exist in the Lacandon Jungle? During the colonial period, Mexican towns were being developed as part of the expansion of the Mexican empire. One of the first buildings to be erected in preparation for settlement in a new area was the convent. In fact, during the 300 years considered to be the Colonial Period, over 300 convents were built ( ). This building could represent a convent built in a failed attempt to settle an area of the Lacandon rainforest.
**Storyline**

In 1645, a Franciscan convent was built in the middle of the Lacandon Rain Forest to begin the establishment of a new town, San Angel, in the state of Chiapas, Mexico. However, the town was never formed and the nuns that lived here disappeared. Today, the deforestation surrounding the convent has forced some individual animals to take residence in the relic. The loss of their native habitat shows us the need for conservation strategies and the importance of relating to animals as partners, instead of subservient creatures.

The storyline will allow for an adventurous visit through the exhibit areas. The visitor will receive a laminated map and field guide upon entrance, encouraging the visitors to choose their own paths and identify animals on their own. Signage is limited, but will provide clues as to direction and location, as well as helping enhance the storyline.

The storyline has a dual nature: creation of a relic, thus incorporating historic cultural features, and present day logging camp. This duality will illuminate the contrast in cultural history as well as differences in habitat richness.

The storyline will be communicated through the creation of spaces and places associated with the convent storyline. Every detail will be associated with the storyline, from the pedestrian paths to the crumbling walls, statues, and potted plants and archway patios created within the old elephant house building.

**Convent Features**

The first step in the translation of the storyline into design is to re-create the idea of a colonial convent. Several elements are considered standards and are consistently found in relics of convents.

1) **Receiving yard:** large, flat, open space where converts were welcomed into the convent. This area is well-manicured and very formal.
2) **Cloister garden:** interior, rectangular space open to the sky. This space is surrounded by patios, generally with archways leading into the garden. The garden itself contains fountains, potted plants, benches, paved paths, and gravel beds.
3) **Well and washbasin:** beautifully simple structures built for the purposes of collecting water and cleaning laundry.
4) **Vegetable and herb garden:** small garden beds where vegetables and herbs were grown.
5) Cemetery and chapel: small area with above-ground graves (typical of Mexican culture) and intimate chapel for funeral service and prayer. Often these cemeteries were planted with fruit and nut bearing trees, symbolizing the rebirth and continual life.
6) Posa chapels: intimate structures used for private prayer and meditation. Found at corners of convent or formal gardens.
7) Orchards: large orchards for growing fruit to sustain convent.
8) Stables and fowl yards: areas for the convent animals.
9) Stone wall: surrounds the entire convent to protect it from outsiders and wild animals.

Each of these areas were laid out on the site in relation to each other and the building (See plan). This created the structure of the site from which the subsequent layers were added. As the animal areas, pedestrian trails, and zookeeper areas were added, the basic layout was adjusted to allow optimal use of the site.

The treatment of the elephant house building will be focused on maintaining the exterior façade. The interior space will be almost completely revamped, removing the
central area of the roof and replacing it with a glass greenhouse roof, and enclosing the
cloister garden with archways. The original doorways will be used as the main entries into
and out of the building, and the original animal doorways will be used as windows for
viewing neighboring exhibit spaces. The building historically was open in the middle with
animal holding surrounding. The new design will simply reverse this situation, holding the
ocelots in the middle with the visitors on the exterior edges, with limited viewing. The small
corner closets and offices will be transformed into interesting display habitats for snakes.

Out-buildings will be built to create settings of the convent. These buildings will
many times double as interior habitat spaces for the animals or as viewing shelters for the
visitors. These buildings will relate to the old elephant house in use of form and materials as
well as in placement.

*Animal Species and Exhibits*

The animal species selected for the exhibit areas are those that would be found
throughout a Mexican rain forest area. Some species are endangered, while others were
selected for their use of disturbed land as habitat. Specific species were selected for their
appeal to zoo visitors. The species list includes mammals, reptiles, birds, insects, arachnids,
and amphibians to ensure the display of the vast species found in the rain forest.

<table>
<thead>
<tr>
<th>Mammals</th>
<th>Reptiles</th>
<th>Insects, Arachnids, Amphibians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider Monkey</td>
<td>Green Iguana</td>
<td>Tarantula</td>
</tr>
<tr>
<td>Coati mundi</td>
<td>Various Snakes</td>
<td>Scorpion</td>
</tr>
<tr>
<td>Ocelot</td>
<td></td>
<td>Poison Dart Frogs</td>
</tr>
<tr>
<td>Jaguar</td>
<td>Green, Blue, and Red Macaws</td>
<td>Salamanders</td>
</tr>
<tr>
<td>Collared Peccary</td>
<td>Keel-billed Toucan</td>
<td>Other beetles, frogs, toads, etc.</td>
</tr>
<tr>
<td>Baird’s Tapir</td>
<td>Curassow</td>
<td></td>
</tr>
<tr>
<td>Two-toed sloth</td>
<td>Various others</td>
<td></td>
</tr>
<tr>
<td>Bats</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The animals were then compared to the convent areas to assign exhibit spaces. Each animal species was evaluated for behavioral and social needs. For example, jaguars are solitary animals until breeding season. They love water and climbing as well as sitting in the sun. Jaguars will need indoor enclosures for winter with access to the outdoor exhibit areas. This species was placed in the formal garden and garden/cemetery/washbasin area to allow access to water as well as ease of access to a shared holding facility in the chapel. The formal garden and garden/cemetery/washbasin
will allow separate exhibits that can be used as alternates. These alternate exhibits are useful for social and environmental changes as rotation of individuals occur.

Example of cable mesh.

Each animal species has specific barriers for containment and safety of visitors. The arboreal and gregarious coati-mundis, sloths, and spider monkeys are contained by cable (wire) meshing that encloses the entire exhibit area including overhead. The jaguar and ocelot barriers are generally glass, to allow safe up-close viewing of the animals. The glass is especially effective near water features where the cats will be playing. Other areas of non-viewing will utilize standard fencing covered in vegetation and large hidden moats (16 feet deep by 16 in width). The non-climbing species, collared peccaries and Baird’s tapir, can be contained by simple low (three feet minimum) fences and walls. The green iguanas are surrounded on the backside by an eight foot moat, and fronted with a four foot glass wall (iguanas cannot climb glass). The snakes will be housed in small glass viewing containers inside the convent house. The insects, spiders, and amphibians are displayed within terrariums disguised as various trunks, footlockers, and shelves within a tent-like structure in the logging camp. The bats are displayed in glass-fronted stable ruins.

Pedestrian Trails

The visitor trails will be clearly defined; however, they will easily blend into the setting of the convent. Several paths are available to visitors, converging at the cloister garden within the convent building. Entrance into exhibit area occurs via one main entrance gate. The entry is demarcated by two large wooden doors set in the exterior stone wall. Because the entrance leads directly into the walk-through aviary, the doors are doubled to stop escape of birds. The paths here are compacted crushed granite, and are large in width.
The area should feel open and allow undirected movement through the aviary, so informal worn paths should be created with visitor use. These paths lead into the convent building via two separate entrances. The choice is up to the visitors. Inside the convent building, the walks are paved with stone pavers and river rock in specific patterns and mosaics. From the building, several paths extend from the four doors. The two paths on the south side of the building and the one entry on the east side begin at a stone paver patio. The paths that extend from here as well as the paths from the other door are also compacted crushed granite to appear informal and sometimes accidental. Some of the paths are covered by vine-covered pergolas to provide shade, create intimate viewing spaces, and also allow glass barriers between visitors and animals.

**A Walk Through Convento de San Angel Exhibits**

In order to fully appreciate the design, an example walk through the exhibit area must be taken. On this walk, we will follow the Hanner family: Mom, Dad, Ethan (age 6), and Greg (age 2).

After visiting the pandas, the Hanners continued along Olmsted Trail. The intriguing entrance and rustic signs piqued Ethan’s curiosity, as he sais, “Hey guys, let’s go in here!”

After passing through the massive double doors and picking up their adventure guide, the family entered into a wooded yard with a fountain as its focus. They noticed birds flying freely all around.
them. Greg immediately ran toward a mound of stones, obviously from the crumbling exterior stone wall. Mom didn’t worry, though, as she could plainly see him across the yard through the foliage. She started birdwatching, wandering off after the perfect photo of the keel-billed toucan. Ethan stayed with Dad, and they wandered around trying to identify each of the colorful birds. Ethan asked about the toucan’s bill, and Dad read from his guide that it’s actually hollow and used for eating fruits and attracting mates.

Greg ran to his mom, pointing out the small cat he can see inside the building through the windows behind the fountain. “We have to go in and see what that is,” he said. The family recollected, and decided to wander into the interesting building through the door on the right.

Inside the building, Greg ran to a small glass wall to see if he could find the cat again. Unfortunately, it’s went somewhere else. He could see a little through the vines and trees inside the archway, but gave up after he saw his brother looking intently into a large hole in the wall. “What’s that?” he asked Ethan.

“Snake!” Ethan answered back.
Mom and Dad noticed the lovely water runnel and small fountain along the floor, as well as the beautiful paving of the floor, the colorful mural on the wall, and the interesting tile mosaics. “It reminds me of our trip to Spain last year,” said Dad.

“Which door should we go out through?” asked Ethan. Dad looked at the guide and pointed to the door on the right.

“The stables, hen, and duck house are that way, and the orchard is that way,” he said then pointing in front of him. Ethan ran off to the stables before Dad could finish his sentence.

“I can see bats!” Ethan said running.

Greg ran off following his older brother. Mom and Dad followed behind. They exited the building and felt the fall sun on their skin. Greg yelled back, “Dad, what’s that?”
Dad looked at his guide and said, “Coatimundi.”

Greg looked perplexed. “What? It looks like a cat or a monkey.”

Dad said, “It’s actually a relative of a raccoon. You know, those guys that got into
our trash this summer.” Greg oohed and aahed as the coatimundis dug at the dirt and hang
from the trees. One sat on the roof of the hen house, soaking up the midday sun.

Mom said, “This must be where they used to keep the hens and ducks. I wonder
what happened to them?”

After looking at the bats in the stables opposite the coatis, the family continued on
down the trail. They stopped when they noticed some movement in the trees in front of
them.
“Monkeys!” yelled Greg and Ethan. The family stopped and watched the group of spider monkeys for a long time, before continuing on down the path. They came to another clearing where they could see more coatimundis. This time, Greg pointed them out and said, “Look Mommy, a coati!”

Soon they came to an intersection. They saw they could enter back into the building, go down a path with a pergola or continue on the path they were on. Ethan solved the problem by finding more spider monkeys.

“Look how close they are! They look so much like us!” Ethan said, as he watched the monkeys through the glass of the fruit storage building.
Mom noticed how much detail is incorporated into the building, finding boxes that open for fruit storage, and sacks and wheelbarrows for collecting the fruit. “This is so neat,” she whispered to Dad.

The Hanners continued down the trail. They followed the crumbling outer wall around a corner and found another relic building. This one was square with a peaked roof and was glass fronted like the fruit storage building. The Hanners noticed some pig-like animals foraging around in the woods to their left, and in the formal garden to their right.

“What are those things?” asked Ethan. “Are they wild boars?”

Dad consulted the guide, and answered that they are collared peccary. They are the wild boars of the rain forest. Greg noticed a group of them rolling in a big mud puddle. He laughed and pointed.

The family wandered along the hedge line of the formal garden and walked into another building like the one they had just seen. Inside, they could see into another building, where a jaguar was lounging on a stone platform.

“What is this building supposed to be?” asked Mom.

After looking at the map, Dad explained it’s an old chapel where the nuns used to come for memorial service for people who died. Mom noticed old benches that could’ve been pews, and wall details where candles used to be placed. The jaguar got up from his perch and disappeared. The family exited the building and continued down the path, under a vegetated pergola. They could see a fountain up ahead, and could get glimpses of the surrounding garden through the vegetation on the sides. Soon, they reached the fountain area, which was open to the sky in the middle, and surrounded on almost all sides by views of animals.

“Holy cow!” said Ethan. “Look at the jaguars! They’re playing in the fountain!”
The Hanners wandered around this fountain area, looking at the jaguars as they lay on the steps and scratched on the fallen tree. From here, they could also watch the peccaries as they played in the mud.

Soon, they continued down the path. They entered back into the building and walked down a hall they hadn’t seen from where they were before. From here, they could see both the jaguars and the ocelots in the interior garden.

The views into the jaguar area looked directly into their pool, and one of the jaguars was playing right in front of the window.

“Mom! Look at the jaguar!” whispered Greg.

Ethan was searching out the ocelot in the garden. “He’s so small, it’s hard to find him,” he said.

“There they are,” said Dad as he pointed out the small cats playing in the foliage.

Ethan said, “They look like Mr. Fluffy!” Dad pointed out, though, that these are wild animals and should be respected for their ability to fend
for themselves in a strange environment that we wouldn’t last a day in. Ethan agreed.

The family continued down the hall and around a corner, into the cloister garden area. Here they could see the archways and the water fountain on the wall, along with another mural and interesting paving. They exited out the door in front of them and noticed they were on a stone patio. They could see an old well, low walls, and lots of potted plants. Then, they spotted the slow moving animal hanging from the limbs of the well.

“What in the world is that?” Ethan asked, grabbing the guide from Dad.

“Two-toed sloth!” Dad said,

“Yeah, they move really, really slow. You have to be very patient to watch him move.” They stood there for a while, and then Greg started to move in slow motion.

“Look, Dad, I’m a sloth!” he said, and the whole family started to laugh.

The Hanners followed the path that lead them quickly under another pergola, through a large hole in the exterior wall, and along a trail. The sloths were with them on their right the entire journey. Finally, they reached what looked to be a logging camp.

“What is this place?” Ethan asked. “Why are there logs everywhere? And look--trucks!” He ran off toward the large equipment, with Mom following quickly after. Dad
and Greg stayed and looked at a large pile of logs, with huge green iguanas crawling all over them. Greg saw the doors were open on the tent next to the logs, and wandered in. Dad wondered if he was allowed to go in. He followed behind.

Inside the tent, they found the sleeping quarters for the loggers. Beds, footlockers, boxes, and tables were set up, and all over them, green iguanas were lounging.

“How cool,” Greg whispered to his dad.

“Yeah,” Dad agreed. They wandered back outside, and saw Ethan and Mom peeping into the truck and tractor. “You wanna go see what they’ve found?” Dad asked Greg.

“Sure,” he said and ran off to them.

“What’d you find?”

“Look at all of this neat stuff. Chainsaws, axes, chains, a tree book…they even have the loggers lunchboxes set out on the seat of the truck,” Mom told him. “What does the guide tell you about this place?”

Dad got out the guide and read aloud. He talked about the native Lacandon people and their need for logging. He also talked about habitat destruction, and how the only animals you find in a devastated area such as this one, are common species like the iguana and tapir.

“Wow,” Ethan said. “What can they do, I wonder?”

Then from inside the tent next to the truck, Greg squealed, “Come look at this!” Ethan quickly obliged, running into the tent. Dad followed, finding another sleeping quarters, but this time, he found the boys rummaging through the boxes and trunks.

“What are you doing?” he asked.

“Look, spiders!”
“And scorpions!”

Hearing this from outside, Mom refused to come in. She instead wandered over to a rustic wood building with glass front. Inside, she saw more piles of wood with a strange little four-legged creature wandering amongst them. She looked beyond the building and found a whole group of them grazing in the field, between branches and stumps of trees.

“Guys, come here!” she yelled back to the tent. “What are these?”

Dad joined her, followed by the two boys. “I don’t know, but I can look.” He looked up the creatures in the guide, and found out they are Baird’s tapirs. “They sort of resemble elephants with that short little trunk thing—apparently, they use that when foraging.”

The Hanners watched the tapirs for a while, then pressed on down the path through the woods. Occasionally, they caught a glimpse of the tapirs. Soon, they found themselves back through the convent wall and looking straight into a cemetery where they saw a jaguar
wandering. They watched for a while then decide to keep walking down the path, under the pergola with hanging vines and shrubs hugging the sides, blocking views of what is just outside. Along the way, the came upon more viewing areas of another jaguar area, this one was in the jungle, but today it’s empty. There was a sign that read, “Look for the jaguars elsewhere. This exhibit is used on rotation so the jaguars can continually experience new environments and social groupings.”

“Hey, that’s neat,” Mom said. “Sounds like they really want to keep their animals healthy and happy.”

Soon, they turned a corner and found themselves face-to-face with another jaguar. This one was lying on the wall of the washbasin. Dad read aloud about the significance of the washbasin, and why the jaguars like to hang out there. Greg was scared by the closeness of the jaguar, and took some coaxing to come in for a closer look.

Finally, he did, but he was nervous the entire time.
Ethan saw a set of small arches overlooking the garden and cemetery area, and quickly ran over to look. He found the jaguar as she stalked through the banana trees. Dad was tired from all of the walking, and sat down on the steps near the building. From here, he could watch both the jaguar at the basin, and the one down below through the arches. He enjoyed sitting in the sunshine, relaxing. “You guys seen enough?” Dad asked.

“No!” said Ethan.

“Well, you can see some more when we walk back through the building and aviary and over to the ice cream place,” he suggested.

The family followed Dad, back through the building, where the boys took one last look at the snakes and ocelots. They wandered back through the aviary, where the boys said
good-bye to the macaws, curassows, and toucans. As they reached the gates, Dad put the
guide back into the box for another family to enjoy on their adventure through the
Convento de San Angel (See axon and detail drawings).
Message and Meaning in the Convento de San Angel

The National Zoo’s historic elephant house and surrounding exhibits carry with them an image of modernist value and celebration of man’s domination over nature. How do we change this image while maintaining the beauty of the structure and the integrity of the historic value of such a building? The answer lies in the treatment of the building in relation to the exterior exhibits. Creating a storyline that features the building as a key element while balancing its importance with the adjacent landscape will enable an exhibit area that not only is imaginative and immersive, but also communicates a positive message and meaning.

In creating the Convento de San Angel, the basic idea was broad—teach about conservation strategies and help influence the public’s philosophy toward animals and nature. Education on conservation strategies will be concentrated in the logging camp, where the focus will be on responsible cultivation of rain forest materials while still helping maintain economic feasibility for the local peoples. The effects of deforestation will be explored, including the loss of crucial habitat for interior species such as jaguar and ocelot as well as the use of disturbed habitat by less specialist species such as the sloth and iguana. The focus is on loss of species diversity, not on the evils of deforestation.

The other idea in the Convento de San Angel exhibits is more subtle: human’s relationship to animals. This message is passed on through the exhibition techniques and immersion of visitor into the habitats. The underlying storyline pervading the convent area is that man attempted to settle an area that was too wild to settle, and we must respect the “wildness” for its beauty and strength to persevere.

But, beyond this, we must realize that one exhibit area is not going to change the world. These exhibits are only meant to intrigue visitors and trigger an interest in animals
and nature. More specifically, the danger in exhibitry is to assume that these environments do not affect the visitors. To assume they do not walk away with an association influenced by the method of exhibitry is naïve. As designers, we must take the lead in creating exhibits that not only entertain and intrigue, but are responsible in their effects. Understanding that we will not educate every visitor that comes through, nor will we influence positively the nature philosophy of every visitor that comes through, but knowing that we will not contribute to the negative connotations of zoos is a first step. It is also a crucial step, because now that we understand the negative connotations sometimes related with historic zoo architecture, we must take the time to redesign and rethink these structures. We should not cover up the past, but we must re-associate these relics with new meanings.


Huelsman, J. E-mail interview with author. November 18, 2002.


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San Diego Union-Tribune. 2001. “Poverty stripping Mexico’s forests—woodcarvers learning conservations economic lesson.”


Woodland Park Zoo. “History of the Zoo.”
Appendix A: Research Data Graphs

Comparison of Observed "Positive" Behaviors and "Negative" Behaviors at Disney's Animal Kingdom Asian Tiger Exhibit

- Positive Behaviors: 79%
- Negative Behaviors: 21%

Comparison of Overall Positive and Negative Behaviors at Philadelphia Zoo's Tiger Exhibit

- Positive Behavior: 52%
- Negative Behavior: 48%
Behaviors of Visitors at Disney's Animal Kingdom Asian Tiger Exhibit

Fountain Overlook

- Quietly watch: 26%
- Talk while watching: 14%
- Point: 9%
- Exclamations of awe: 5%
- Wait for good view, watch from behind group, move in for better view: 27%
- Hold up child to see over crowd: 5%
- Walk thru/Quickly look: 0%
- Take pictures: 5%
- Talk to docents: 9%

Bridge Viewing Area

- Quietly watch: 21%
- Walk thru/Quickly look: 29%
- Talk while watching: 8%
- Leave quickly/Move thru but stop at end: 5%
- Talk to docent: 3%
- Take pictures/videotape: 13%
- Exclamations of awe: 6%
- Talk about tiger facts: 5%
- Bad behavior: 3%
- Wait for good view /View from behind crowd: 2%
Behavior of Visitors at Disney's Animal Kingdom Asian Tiger Exhibit

Temple Viewing Area

- Talk about tiger facts: 9%
- Walk away quickly: 3%
- Loud talk: 2%
- Take pictures/videos: 9%
- Point/Point out to others: 9%
- Talk watching: 14%
- Walk thru/Quickly look: 13%
- Wait for good view, view behind crowd: 8%
- Exclamations of awe: 5%
- Search for tigers: 16%
- Watch quietly: 12%
- Take pictures/videos: 9%
- Loud talk: 2%
- Walk away quickly: 3%
- Talk watching: 14%
- Walk thru/Quickly look: 13%
- Wait for good view, view behind crowd: 8%
- Exclamations of awe: 5%

Comparison of Visitor Time Spent at Each Study Location at Disney's Animal Kingdom Asian Tiger Exhibit

- Fountain: 116.4 seconds
- Temple: 109.75 seconds
- Bridge: 45 seconds
Visitor Time Spent at Disney's Animal Kingdom Asian Tiger Exhibit

**Bridge Viewing Area**

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<tr>
<td>Afternoon</td>
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Average Time Spent at Disney's Animal Kingdom Asian Tiger Exhibit

**Fountain Overlook**

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<tr>
<th>Time of Day</th>
<th>Time (seconds)</th>
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<tbody>
<tr>
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Visitor Time Spent at Disney's Animal Kingdom Asian Tiger Exhibit

Temple Viewing Area

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Visitor Counts at Disney's Animal Kingdom Asian Tiger Exhibit

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<th>Sample Areas</th>
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<td>Temple 1</td>
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<td>Temple 2</td>
<td>73</td>
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<tr>
<td>Bridge 1</td>
<td>51</td>
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<tr>
<td>Bridge 2</td>
<td>46</td>
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</table>

<table>
<thead>
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<td>Children</td>
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<tr>
<td>Fountain</td>
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<tr>
<td>Temple 1</td>
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</tr>
<tr>
<td>Temple 2</td>
<td>73</td>
</tr>
<tr>
<td>Bridge 1</td>
<td>51</td>
</tr>
<tr>
<td>Bridge 2</td>
<td>46</td>
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</tbody>
</table>
Total Adults vs. Total Children in One Day at Disney's Animal Kingdom Asian Tiger Exhibit

- Adult: 70%
- Child: 30%

Adults vs. Children at Philadelphia Zoo’s Carnivora House Tiger Exhibit

- Adult: 69%
- Child: 31%
Average Time Spent at Viewing Areas
at Disney's Animal Kingdom Asian Exhibit
and Philadelphia Zoo's Carnivora House Tiger Exhibit

Visitor Behavior at Philadelphia Zoo's Carnivora House Tiger Exhibit
Inside Viewing
Visitor Behavior at Philadelphia Zoo's Carnivora House Tiger Exhibit

**Outside Viewing**

- Walk by: 10%
- Point out tiger: 7%
- Watch quietly: 12%
- Talk watch/Do something else: 12%
- Talk about tigers: 4%
- Hold kids up: 5%
- Bad behavior: 9%
- Take pictures/videotape: 5%
- Walk around exhibit: 20%

**Average Time Spent at Philadelphia Zoo's Carnivora House Tiger Exhibit Inside Viewing**

- Morning: 97 seconds
- Afternoon: 116 seconds
Average Time Spent at Philadelphia Zoo’s Carnivora House Tiger Exhibit Outside Viewing

Comparison of Average Visitor Time Spent at Each Study Location at Philadelphia Zoo’s Carnivora House Tiger Exhibit
Appendix B: Positive and Negative Behaviors

Positive
- Watch quietly
- Point
- Talk about tiger
- Take picture/videotape
- Exclamation of awe
- Hold kids up

Negative
- Walk by
- Talk about something else/Look at something else/Do something else
- Bad behaviors
- Look quickly