Design Australia

Biomes and Immersion Exhibitions

at the

Columbus Zoological Park

Columbus, Ohio
Jeffrey Allen Bogle

Design Australia: Biomes and Immersion Exhibitions

at the Columbus Zoological Park
Columbus, Ohio

May 1995
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Design Australia: Biomes and Immersion Exhibitions

Bachelor of Architecture Degree Program
Thesis Design

Thesis Design Committee

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Dedicated to:

The One - "I am"
Mom and Dad
Granny
Karla
Mike
Gary
Jenny
Chad
Josh
Shoe
Mr. William S.W. Baker
Jack Wyman
Les Smith
Rob Bennett
Mr. Ruberg
Clyde
Tee
Barney
and me...

And ye shall seek me, and find me, when ye shall search for me with all your heart.
Jeremiah 29:13 (KJV)

May 1995
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"In the end, we will conserve only what we love. We will love only what we understand. We will understand what we are taught."

--Baba Dioum

Senegalese conservationist
In recent years, people have begun to appreciate that we, as humans, have been rather careless with how our activities impact other life forms on a global level. Biodiversity has become a catch phrase to encompass and encourage conservation efforts.

The term biodiversity is composed of two different words, *bios* and *diversity*, which translates into the definition of a difference or variety of life. It refers the large variety of life forms that comprise and make up the entire biosphere of our planet.

For the many years that humans have existed, we have coexisted with a variety of other species. Species have come and gone; humans did not drive the dinosaurs to extinction. But within the last 300 hundred years, a small amount of time when considered against total history, there has been an extraordinary loss of species to extinction.

Much of this loss of life is due to our lack of knowledge and understanding of the interdependence of all species. Each species which becomes extinct weakens the links in our entire life support system. We need to be aware of the consequences of our actions.

In recent years, we have been impressed with new scientific and genetic knowledge about the machinery of life. It is a large and complex subject, but it also one which needs to have top priority. With our reflection upon the interdependence of the human species with all other species, and our increasing awareness of the accelerating environmental crisis threatening the earth's natural ecosystems and animal populations, the priority becomes much more evident.

Biodiversity is a complex subject to deal with, but we can deal with it on a smaller scale while making a large scale impact; enough small steps do make a difference. Zoological parks (zoos) have become central in advancing science, technology as the roles of zoos gradually evolves; these areas are essential to preserving the earth's natural ecological diversity. The most important impact of zoos lies in their educational programs.

The implementation of broad-based and far-reaching educational agendas that successfully communicate the importance of biodiversity and the severity of the extinction crisis is undoubtedly necessary, and indeed crucial. Zoological parks are changing their roles from the idea of the animal collections and menageries of the past to vital centers emphasizing the importance of education for conservation. These parks and conservation centers are among the best alternatives to educate the public in preserving the earth's natural diversity and bounty. The move is away from exhibiting species to educating about the majestic panorama of nature.
"The living animals that attract the visitors form the basis for zoo education. They provide a unique harmony between the recreational purpose of a visit to the zoo and effective education. The attractiveness of living charismatic animals serves as a starting point to stimulate the visitors' interest in the subtle relationships and balances of the living world."

--World Zoo Conservation Strategy
Executive Summary, 1993

Tropic World Immersion Exhibit at the Brookfield Zoo.
In the past, zoos were thought of as places where people could go for entertainment, where animals were confined in bare cages (occasionally with a rock or a tree for "atmosphere"). The goal of many zoos was to collect as many different species as possible (e.g. one Asian elephant, one red kangaroo, one koala, etc.). In general zoos were a menagerie of animal curiosities, and the animals were most commonly treated as such.

Animals in the zoos of the past were confined by themselves, no matter if they were normally social in the wild. And most often, these animals had nothing to do but eat, sleep, sit around, or pace to and fro. Animals often died from improper care or even sheer loneliness. The zoo was not there to educate; there were no signs or programs to explain the animals or their role in the earth's natural ecosystems. The zoos were no more than freak shows.

Within the last twenty years, zoos have begun to change their role and fundamental goals. Exhibitions of animals are now created to imitate the natural environs of the animals. Gone are the bare cages and solitary animals, at least for the most part. Zoos are creating whole ecosystems including native plants, trees, soil, water, temperature, and humidity in order that the animals may move about freely and lead fairly normal lives. New exhibits have different species interacting much in the same way as they do in the wild.

Thesis Statement

But the most important improvement lies in the creation of programs developed to educate people about the dwindling natural habitats and ecosystems of many creatures worldwide.

The goal of this thesis project is not to present comprehensive standards, criteria, or guidelines for the housing, breeding, and exhibiting of captive animals. It would take many years and a team of experts to accomplish such a lofty goal. The goal is to focus on generating ideas which may conclude in good exhibit design. The design and planning ideas are to recognize and build upon the development goals incorporated by accredited zoological parks.

The goals for the project have been to (1) promote creative thought and devise a unique design solution to translate general education, recreation and conservation goals into physical conditions; (2) apply disciplinary knowledge and skills in the design of a portion of a zoological park and the associated educational exhibits; and (3) become aware of the factors that determine an individual’s responsibilities and contributions to complex environmental development projects through topics which include (A) park exhibit and interpretation themes; (B) program, exhibit viewing and barrier planning criteria; and (C) architectural and site planning concepts.
The scope of the project deals with two biomes of the Australian geographic region. The building to the left is "The Forests" exhibition while the building to the right is "The Plains." The reservoir is to the north in the upper left of the model.
Site Analysis

The site selection for this project is primarily determined by existing features of the Columbus Zoological Park. The current circulation patterns for the entire park complex are somewhat arbitrary, confusing, and incoherent.

Design Australia will add a level of hierarchy to initiate the redevelopment of the circulation paths. The site is located adjacent to the waterfront at a far corner of the park. This site location necessitates an emphasis of educational programs and built forms in order to draw the visitors.

The site itself is organized along an interior and exterior circulation configuration to maximize the potential for a variety of indoor and outdoor movement paths while experiencing a range of educational exhibits and programs.

Organization of the entire Design Australia complex revolves around an entrance and an exit point located at opposite ends of the site. The circulation program parallels existing adjacent paths to maximize coherency while allowing a cross circulation between exhibition buildings to the exhibits on the north side, the waters edge and the boardwalk.
Site Plan

and Location Map

See Foldout

Site Plan for the Design Australia immersion exhibition project at the Columbus Zoological Park in Columbus, Ohio.
The culmination of design in this thesis project is due to much information received through various periodicals, publications, journals, books, and outside educational sources. As a supplemental project of study, I contacted various conservation groups and zoological parks in order to obtain information that I might be more sensitive to the needs of the animals and people (keepers, curators, directors, staff, and visitors) for which I am designing.

The response to my requests for information has been tremendous. Out of more than thirty letters requesting information and suggestions, I have received back information from nearly all. Appendix A is a listing of groups and organizations to which I sent my requests and from which I received a response. Appendix B is a sample letter requesting information.

Research Review

In the letters requesting information, my goal centers on ascertaining the current trends and techniques being used in zoological parks worldwide. My research is concerned with the new trends in zoological park architecture and how these trends relate to the changing roles of these parks into conservation centers.

In the responses to my letters, I received information in various ways. The groups most generally sent information which outlines their involvement in worldwide conservation efforts. Other responses had personal messages responding to questions and suggesting other resources to consult. And other responses referred me to other organizations and individuals actively involved in this area.

Christine Stevens, President of the Animal Welfare Institute, responded with a personal letter and suggestions. In her letter of response, she agreed that zoological parks need to be served by the profession of architecture just as these centers are being served by new scientific technology. But she also says, "Regrettably, architects have, in the past, failed to take serious note of the needs of the animals."

It has become apparent to me through this research that, in fact, architecture has, in the past, failed in meeting the needs of animals within zoological parks. Too often the animals needs have been overlooked to better meet the needs of finance and entertainment. This
Research Review

oversight has done a lot of damage to the credibility of many of today's zoological parks.

Also included in my requests for information is my goal to become aware of the factors that determine an individual's responsibilities and contributions to the complex environmental development projects and conservation programs. Christine Stevens emphasizes that it is important to keep in mind that the greatest need is to prevent extermination of animals in their native, wild habitat throughout the world. No one should be encouraged to think that zoos can "somehow mop up the harm which exploitation and so-called 'wise use' are doing at a record pace."

It is true that too many people think that zoos can handle the preservation of animals regardless of the destruction of their environment. However, attempts to reintroduce endangered species not infrequently backfire. In the worst cases, diseases are introduced by captive-bred animals into a very small and badly threatened population.

Excessive attempts at fund raising and at entertaining the public, rather than serious educational work by zoos, have marred the good influence which many zoological parks could have. The goal of these zoological parks should be the implementation of broad-based and far-reaching educational agendas to successfully communicate key issues to the visitor.

Appendix C is another letter and paper called "Adieu to the Zoo?" that I received from my requests for information. David Hancocks, Executive Director, of the Arizona-Sonora Desert Museum in Tucson Arizona, paints an interesting and vivid picture of the past and the future of zoos.

In his discourse, Mr. Hancocks takes the reader into the future by looking into the past; he raises some very interesting questions in the process. He also raises some troubling questions about the funding for zoos.

Mr. Hancocks writes about the "shaky foundations" of the new exhibits. He calls the improvements "only cosmetic." He challenges that the new exhibits also change some of the zoological semantics by manipulating the word "cage" into the word "habitat." But throughout his paper, he raises valid questions which need to be considered.

Although Mr. Hancocks seems to be hard on zoos, he is not campaigning for their eradication; he strongly encourages change. Change does not occur only in the cosmetics of the new zoo and its habitats; it delves much deeper into the heart of the issues. I strongly recommend this paper for a varying perspective on zoos.

Other aspects of my research concentrates on the Columbus Zoological Park and its emphasis on conservation and long-term goals. The zoo attracts over
a million visitors each year. It provides educational opportunities for over 62,000 students in preschool through graduate school.

According to Into the Future: The Columbus Zoo Case For Support, "Our understanding of the natural world is enhanced by the Zoo's involvement in research and conservation programs. These programs will enhance efforts in central Ohio and around the world, and help maintain healthy animal populations."

The Columbus Zoological Park serves as an excellent site for this project and its goals and aspirations due to the zoo's attitude towards conservation and education. This is stated clearly in part of the zoo's mission statement.

"To promote awareness and understanding of the interdependence of the natural world, and to present our community interactive, participatory, and educational exhibits and activities which represent that relationship.

"The Zoo shall achieve its mission by teaching and practicing conservation, both on and off-site, contributing to the discovery of biological knowledge, offering enjoyable educational and family-oriented recreational opportunities, and instilling in all who visit a sense of adventure and discovery."

My research has also encompassed current periodicals and books dealing with the topic of the new zoo. Many of these works may be found cited in the bibliography. I also conducted another method of research by visiting several local zoological parks which include The Indianapolis Zoo, The Columbus Zoo, The Brookfield Zoo (Chicago, IL) and Lincoln Park Zoo (Chicago, IL).

Throughout all of the zoos I have visited, the conservation and educational efforts are evident. Each zoo concentrates on different areas to support and research. The zoo then educates the public of its findings through various interpretive material located throughout the park and adjacent to corresponding exhibits.

In conclusion, there is much information available just for the asking. Each of the organizations listed in Appendix A are more than willing to educate through the various informational resources they have available to them. Through these organizations, I have learned of the significant impact of zoos. Every year, zoos draw more people than all major professional sporting events, combined! A good zoo serves more people, from more backgrounds, in more ways, than any other cultural or recreational institution. Just imagine the opportunity for education!
Project Model
The environment of the zoological park is complex and interesting. It is an environment which needs to incorporate the needs of the animals being exhibited, the visitor, the keepers and staff, the directors, and the curators simultaneously. The most important needs are those of the animals and of the visitors.

The zoo environment is a home to many animals. People perceive this type of environment as being necessary to prevent the extinction of many species, but they do not understand the idea of conservation. People do not realize the urgency of the extinction crisis with which we are faced. Zoos have become the "band-aid" to solve all of these problems.

The zoological park is currently going a step beyond "band-aid" status to try to design to meet the needs of these animals. The animals within zoological parks are born in captivity most of the time. It is a rare occurrence to bring in an animal from the wild, but it does happen. The animals are born and raised within the zoo environment while their natural habitats are being destroyed at an alarming rate every day.

The zoological park is viewed as a sanctuary for the endangered species of the planet. Zoos have taken on the roles of conservation with efforts to sustain and encourage breeding in endangered species. But zoological parks have limitations within themselves, including the physical and economic boundaries.

In *A Crowded Ark* by Jon Luoma, the description of a rendered drawing sums up how zoos envision themselves.

At the center of the picture is an ark. Siberian tigers and Przewalski's horses stand on its decks, peeping out of portholes and over the gunwales. A giant panda is up to its neck in the water, but at least near the hull of the ark and hanging on precariously by a life rope. Sumatran rhinos, a scimitar-horned oryx, a wisent, a California condor, a monkey-eating (or Philippine) eagle, a Chinese alligator, and a king cobra are adrift on rafts. The eagle, wearing a bandage across its breast, looks particularly battered. On the roof of the boat are the words ZOO ARK, and above the ark, nestled in a puff of cloud, is a dodo with a halo over its head.

We need to have a starting point in order to attempt to mend some of these problems. Zoological parks seem to be the obvious choice to begin to educate. This brings up the second most important need, the need of the visitor, and of their education.

There are more visitors to zoos than all major professional sporting events combined. A good zoo serves more people, from more backgrounds, in more ways, than any other cultural or recreational institution. This type of attraction demands educational programs concerning our environmental crisis.
Thesis Arguments

To accomplish both tasks of caring for the animals within zoos and educating the public about habitat destruction, the exhibitions set the stage for the well-being of the animals, as well as the education of the visitor.

The exhibit you see when you go to a zoo or an aquarium is much like what an audience sees at a theatre performance. It is only a fraction of the action. The animal exhibition areas represent approximately 25 percent of the zoo as a whole. The remaining 75 percent are the activities behind the scenes.

The exhibit and the visitor areas often overshadow the other parts of the zoological park complex such as off-exhibit facilities, animal hospital, commissary, and other service buildings. Although it is these invisible areas which account for 75 percent of the makeup of zoological parks, the other 25 percent determine their success.

The organization of Design Australia attempts to reflect the arguments presented within this book. My preliminary thoughts for this project deal with designing from the perspective of the animal with an important emphasis on visitor interaction, circulation, and education. The task proved too large to complete within the time constraints of a semester, or sixteen weeks. Such a project would require in-depth knowledge of multiple species, including social interaction, feeding, sleeping, and other habits. But such a project would be feasible in order to design for the primary user, the animal.

In early zoos, the visitors would look down into a pit to see animals such as orangutans or bears, and, unfortunately, some zoos are still like this. The evolution of zoos and exhibit designs now places the visitors as guests in the world of the animals. The park setting differentiates the animals not necessarily according to species, but according to (1) the appropriate geographic region and (2) the appropriate biome. Chances are good that you will never encounter a polar bear in the tropics or an elephant in the Arctic. The reason is that the world is divided into different biomes. Biomes are communities of plants and animals adapted to specific environments.

Other trends of earlier zoos exhibited the animals and attempted to educate in a outdoor setting. Often during the cold winter months, the animals are not allowed to socially interact or get outdoors. They are confined to the limits of the pens. The idea of the immersion exhibition, which works best in a controlled indoor environment, fringes on the concept of duplicating the amount of exterior exhibition space on the interior. Doing so would allow the zoo to operate more efficiently 12 months a year while educating the public and better caring for the animals' needs.
The focus of this project will be on the continent of Australia (thus defining the geographic region). The scope of the Design Australia complex is a series of four exhibition buildings taking the visitor through a series of biomes in a progressive manner to allow them to travel from the shorelines, waters and the Great Barrier Reef of northeastern Australia to the deserts, grasslands, and savannas of the interior, progressing into the forests and tropical forests of the perimeter of the continent. The continent of Australia has been isolated for a very long time, and its natural animal inhabitants are quite unique.

The visitor enters the project site from the northeast corner near the zoo’s new aquarium. The entry is placed as a result of research into the zoo’s ten year masterplan. The zoo is developing a series of geographic areas with interrelated biomes and organizing the circulation paths into a more coherent pattern.

The visitor enters each of the four buildings (The Waters, The Deserts, The Plains, and The Forests) progressively. Within each building, the visitor also follows a progression in order to maximize the effectiveness of the educational programs. Each of the exhibition buildings are organized to provide a transition sequence into the respective biome, an introductory educational sequence, small interchangeable displays, moderately scaled displays (walk-by exhibits), and a full immersion exhibit. Each exhibition building also contains an educational resource center containing information specific to that biome.

The exhibition buildings are designed to provide a relationship between the interior and exterior exhibits to maximize the potential for understanding of the exhibited species and represented biomes. The visitor, as well as the animal, has a certain freedom of movement between the interior and exterior and different exhibition areas at certain key points reflected in the interior and exterior circulation paths.

A listing and brief explanation of various exhibits provided within and immediately adjacent to The Plains and The Forests exhibition buildings is provided in Appendix D. The exhibits are modeled after the Healesville Sanctuary Master Plan (Zoological Board of Victoria, Australia).

The Plains exhibition building is organized to maximize the potential for educating the visitor to the chaparral, treeless grassland, savanna and woodlands biomes. In The Plains, the visitors are availed of the opportunity to encounter native animals at close quarters within the context of a healthy, functioning habitat. After entering the doors on the east side of the building, the visitor steps into the educational resource center.
Thesis Arguments

The educational resource center's purpose is to aid the visitor's transition from the previous exhibit experiences to those of The Plains. Within this center, the objective is to educate the visitor so that once they reach the immersion portion of the exhibit, they may totally involve themselves into the environment of the animal with no interference of signage or educational material.

The educational resource center also serves another purpose. In all of the exhibition buildings, the educational resource center serves to update frequent zoo visitors as to the new attractions and their locations. The educational resource center may serve as a direct path to other exhibits. Due to this option, the center serves as a place for temporary exhibition pieces which change periodically. These offer an additional chance to educate the frequent visitor, as well as the infrequent.

From the educational resource center of The Plains, the visitor has several options. One option is to move through to other exhibits, as stated above. Another option is to experience the Kangaroo Tales exhibit (as outlined in Appendix D) immediately adjacent on the exterior of the center. The third and final option is to move through the exhibit area portion of the building.

In the exhibit portion, The Bush Birds aviary and World of the Platypus exhibition tank align both sides of the corridor with high levels of interpretive materials. As the visitor progresses, the Tasmanian Devils and Reptile Encounters exhibits round out the moderately scaled, walk-by exhibits.

The culmination of the educational experience is found in the immersion exhibit at the end of the journey through The Plains. The immersion experience will take the visitor through various habitat typologies including the grasslands, the woodlands, and the fringes of the mountain forest (to prepare for the next immersion exhibition in The Forests).

The circulation path for The Plains is unidirectional to insure the maximum potential for education. The visitor may only enter the building from the east (along the prescribed circulation patterns). In prescribing the experiential path of the visitor, the exhibits may unfold with the ultimate goal of the immersion experience.

After leaving The Plains, the visitor encounters an exterior gathering space ideally suited for small lectures and presentations of certain animals at various times throughout the days. The tower located here houses the stage for the performances of various entertainment and talks while accompanying larger groups in the corridor adjacent to The Plains building.
During inclement weather, the tower may also service smaller groups for similar educational talks. The space is suited for circulation between the buildings to the boardwalk and exhibit spaces located adjacent to the reservoir.

The Forests exhibition building is organized to maximize the potential for educating the visitor to the boreal forest, temperate forest, and tropical rain forest biomes. In The Forests, the visitors are, again, availed of the opportunity to encounter native animals at close quarters within the context of a healthy, functioning habitat. The building houses the largest of the immersion exhibits within the complex to emphasize a sense of awe as to the power of nature and its rapid destruction.

In the visitor’s progression through the building, The Forest follows the same parameters as the rest of the complex in that the visitor’s first experience is the educational resource center. Within the educational center, The Forests offers the same opportunities for frequent zoo visitors as The Plains.

The visitor then passes through the Habitat Aviary into the walk-by exhibition area. In this area of the building, the visitor is exposed to exhibits of The Creatures of The Night and The Koalas. Both exhibits have a high level of interpretation to aid the visitor in understanding these creatures and their natural environments.

The Forest immersion exhibition is scaled up from the previous immersion exhibition experiences. The immersion experience will take the visitor through various habitat typologies including the marshlands, the forest fringe, the forest canopy, the souther rain forest, into the billabong and bushlands. From this exhibit, the visitor may leave the entire complex to move on to the next portion of the zoological park.

Future development opportunities are open as to the possibility of blending exterior and interior exhibits while diffusing the buildings and the controlled environments to the exterior. Opening the buildings and diffusing the hard line between interior and exterior will offer a more interactive approach to education to the visitors and caring for the animals exhibited.

Future development also needs to place emphasis upon improving the diversity of the visitor experiences by maintaining a wide variety of displays, viewing aspects, interpretation levels and a satisfying sequence of interactions. Development also needs to continue to provide a diversity of exhibit design. This diversity should incorporate varied techniques to reflect habitat and encourage naturalistic and healthy behavior of animals. The ultimate goal of the entire project is to center on conservation efforts.
Design Drawings
Design Drawings
Ground Floor Plan

See Foldout
Project Model
Design Drawings
Lower Level Floor Plan

See Foldout
Design Drawings
Design Drawings

Building Elevations

See Foldout
Design Drawings
Building Sections

See Foldout
Project Model
Project Model
The design process begins with looking at the project site. The site itself has the appeal of being the ideal site for such a project for many reasons. One reason is that there is a lot of potential for the design to pull people across the park to experience the exhibits and various activities held daily. If successful, the project would then potentially be right in the middle of most of the visitor activities at the zoo. Another appeal of the site is the proximity of the reservoir. The water has a soothing effect appropriate to place people in the right mindset for the project's educational goals.

Considerations for design proposals begin with studies of existing facilities. A behind the scenes tour at the Columbus Zoological Park reveals the necessary correlations between the support spaces, animal pens, animal exhibitions, and visitor circulation. The interaction between these spaces is complex and dynamic.

Preliminary ideas treat the project as a single, although very complex, building housing all of the animals, keepers, staff, director, curator, and visitor needs. The objective is to replicate the amount of exterior exhibition space with interior immersion exhibition space; supplemental exterior exhibitions would be given secondary consideration. The complex would be a series of individual exhibitions and educational nodes along a primary circulation path with the climax of the experience being in the immersion exhibition. The immersion exhibition would house all of the various biomes found on the continent of Australia.

The circulation system is seen as the primary means to control the character, rhythm, and focus of the educational storyline. It is the hierarchy of pedestrian routes that controls and organizes the spatial sequence of animal encounters. The common overlap zones between man and nature becomes the primary place for visitor movement. This allows the visitor to gain some insight as to the dynamic dependence between the human species and all other species.

The animals would be exhibited collectively for the continental region of Australia and the accompanying biomes, along with appropriate selections of birds, fishes, and reptiles. The integrated exhibition offers the visitor a wide range of sensory perceptions encompassing color, shape, and textural contrasts. The goal is to heighten interest and to animate the specific biome while educating.
Diagrams and Sketches

Organization

Transition

Series of spaces for each biome.
Diagrams and Sketches

Progression through a series of buildings.
Diagrams and Sketches

[Diagram of Tropic World at Brookfield Zoo with illustrations of flora and fauna]

[Diagram of a display area with labeled sections: Display, High, Pub, Visitor, and Habitat]
Design Development

The development of the design has made tremendous leaps from the initial thoughts of my schematic design. The information I received from correspondence has influenced and modified my thinking concerning various aspects of design in the zoological park environment.

One of the most significant developments over schematic design is the consideration of the building envelope. The building needs to recognize its own environment and interact accordingly. The design moved away from the monumental single building housing all of the various geographical biomes of Australia to scaled down exhibition buildings representing four of the major biomes. The movement is also away from just replicating the amount of exterior exhibit space on the interior.

An aim of the project is to determine how architecture may influence the educational aspects of zoological park environments which are moving away from the bare cage menageries to immersion exhibitions. If taken to the opposite extreme of the menageries, the immersion exhibitions are equally as devastating. The happy medium lies in the educational focus of the captive animals and conservation efforts.

With this aim in mind, the project refocuses on the interaction of the interior and exterior exhibit space. Through research, I have found that animals in captivity are often bored. These animals tend to have a behavior pattern which is visually repetitive. Although the animals are "captive" for many reasons, there is ample opportunity to design dynamic environments to both allow the animal to lead a more normal existence, and allow the visitor to develop a deeper understanding of the natural habitat of the species exhibited.

Design Australia is concerned with the behavioral aspects of both the animals and the visitors. The immersion exhibitions, and other moderately scaled exhibits, offer the opportunity for the animal to change to a different environment. The immersion exhibitions, other indoor exhibits, and exterior exhibits are all interconnected on the lower level. With a periodic rate of change, the animals could be in several different environments within the span of a day. Although this dynamic aspect of habitat design needs to be monitored and controlled, it will go a long way towards avoiding visual repetitive behavior.

Design Australia is also concerned with behavioral patterns of the visitor. Visitor attention is a must. The initial impression of the exhibits are extremely important due to the perceptual influences and how they affect the experiences which follow. The approach to the design is oriented such that the types of reactions and emotional goals are envisioned before the final arrangement of the "theatre set." Education is the key!
Sketches and Diagrams

Early elevational study of the articulation of interior-exterior movement. Drawing is of south elevation towards the boat dock.
Sketches and Diagrams

Early elevational study of building form, massing and articulation of detail.
Sketches and Diagrams

Early elevational study of building form, massing and articulation of detail. South Elevation.
Sketches and Diagrams

Final stages of an elevational study sketch of The Plains exhibition building (above).

Early sketch studying massing forms for The Forests exhibition building (left).
Study sketch of a section through The Plains exhibition building.
Final stages of planning for The Forests exhibition building.
Bibliography


Appendices
Appendix A

Listing of Correspondence and Addresses
Appendix A

American Association of Zoo Keepers
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Topeka, KS  66606

The American Society for the Prevention of Cruelty to Animals
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American Zoo and Aquarium Association
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Bethesda, MD  20814

Arizona-Sonora Desert Museum
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Tucson, AZ  85743-9719

Bassett Associates
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Lima, OH  45801

Brookfield Zoo
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Brookfield, IL  60513

Columbus Zoo
Box 400
Powell, OH  43065-0400

Conservation International
1015 18th Street NW
Suite 1000
Washington, D.C.  20036

Elephant Alliance
6265 Cardero Drive
La Jolla, CA  92037

Fund For Animals
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New York, NY  10019

Healesville Sanctuary
Badger Creek Road
Healesville
Melbourne, Victoria  3777
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Humane Society of the United States
7000 Professional Drive
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Indianapolis Zoo
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International Union for the Conservation of Nature
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Appendix A

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Arlington, VA 22209

Natural Resources Defense Council
40 West 20th Street
New York, NY 10011

North Carolina Zoo
4401 Zoo Parkway
Asheboro, NC 27203-9416

Royal Melbourne Zoological Gardens
Elliott Avenue
Parkville
Melbourne, Victoria 3052
Australia

San Diego Wild Animal Park
15500 San Pasqual Valley Road
Escondido, CA 92027

San Diego Zoo
Box 551
San Diego, CA 92112

St. Louis Zoo
Forest Park
St. Louis, MO 63110

Tracy Aviary
589 East 1300 South
Salt Lake City, UT 84105

Trout Unlimited
800 Follin Lane SE
Suite 250
Vienna, VA 22180

Universities Federation for Animal Welfare
8 Hamilton Close
South Mimms, Potters Bar
Herts, England EN6 3QD

Wildlife Conservation Society
185th Street and Southern Boulevard
Bronx, NY 10460

World Wildlife Fund
1250 24th Street NW
Washington, D.C. 20003

The Wolf Fund
Box 471
Moose, WY 83012

Zoocheck
c/o Virginia McKenna
Born Free Foundation
Coldharbour, Dorking
Surrey, England RH5 6HA
Appendix A

Zoocheck Canada  
5334 Yonge Street  
Suite 1830  
Toronto, Ontario M2N 6M2

Zoo Conservation Outreach Group  
c/o Fossil Rim  
P.O. Box 2189 Rt. 1, Box 210  
Glen Rose, TX 76043

Zooplan  
Zoological Planning Associates  
Attn.: J. Michael Rice  
1415 E. Second Street  
Wichita, KS 67214
Appendix B

Sample Letter of Correspondence
To Whom It May Concern:

I am currently a student enrolled in the fifth year at Ball State University's College of Architecture and Planning in Muncie, Indiana, and I am writing to inquire about any information which you may be able to send to assist me in my quest to complete my fifth year thesis project. Since it is my final semester before the completion of bachelor degrees in architecture and environmental design, I am actively pursuing a thesis project which deals with new trends in zoological park architecture and how these trends relate to the changing roles of these parks into conservation centers.

As the roles of zoological parks evolve, the architecture must also evolve to meet the changing needs. My thesis project deals with concepts of animal displays and the education of the zoo visitor about current trends and techniques in conservation of the earth's natural ecological diversity. The implementation of broad-based and far-reaching agendas to successfully communicate the importance of biodiversity is crucial. I believe that zoological parks and conservation centers are among the best alternatives to involve the public in preserving the earth's natural diversity and bounty. But just as these centers are being served by new scientific technology, I believe they also need to be served by the profession of architecture as well.

In conclusion, one of my goals for this project is to become aware of the factors that determine an individual's responsibilities and contributions to the complex environmental development projects and conservation programs. Any information which you may be able to provide which you feel may directly relate to my project will be greatly appreciated. I assure you that it will be used to educate a great many people during the presentation of my final proposal. Thank you for your time and effort.

Sincerely,

Jeffrey A. Bogle
Appendix C

Letter and paper from
David Hancocks, Executive Director
Arizona-Sonora Museum
March 6, 1995

Dear Jeffrey Bogle:

I have given careful thought to your letter of February 26, but am not at all certain that I can give you any useful assistance. You say that your thesis deals with "trends in zoo architecture" and how these relate to the changing roles of zoos and zoological gardens. Unfortunately, I do not believe that zoo products are or can become conservation centers. Their most valuable potential is in education, and in this regard I think that the recent shift towards landscape immersion exhibits and biomimetic zoning has some merit. The most recent issue of the AZA Proceedings (1994) contains an article by Jon Coe which could help you.

Also I am enclosing a copy of a paper I recently presented in London, "Adieu to the Zoo," which I hope might be of interest.

Good luck with your project.

Sincerely,

David Hancocks
Executive Director

DHs
Enc.

Enclosure
structure. Botanical gardens that remain little changed in concept or in collection. Although gardens provided a readygrove audience to marvel at their extent, the Buckingham Palace and the royal family's interest in plants cemented the Victorian era's grandeur as an exemplar of mid-18th-century society. By the late 18th and early 19th centuries, zoological gardens flourished in the late 18th and early 19th centuries, providing opportunities for the study of exotic and unshown beasts. The London Zoo Society of London as a home for all manner of strange features recognized that nature could heal and restore the spirit. Nature can be seen as something of interest, and zoos are often visited by people like Lord Byron and Joseph Hooker to find new species for their collections. The Royal Gardens, St. James, and the Natural History Museum were started by explorers of new wildlife. These were the early days of the art of growing interest in the exotic, and the interest in nature became fashionable. There was no other invention of the century. It was the dawn of a new age of the garden. The early 19th century saw the development of the first zoos, and the zoos were no longer just as we enter the first century. A few years, it was not 100 years, but it was 90 years. It was not just a couple of centuries, and the zoo was not just a couple of centuries.}

Finally, I think they will not question why zoos are here, except that...
Today we still find, in almost every city, a garden with plants in one part of town - the botanical garden - and a garden with animals in another part of town - the zoological garden. Sometimes we also find another picturesque park, called an arboretum, and maybe another place called a natural history museum. There might, too, be yet a different place, trying to tell the story of geology.

Within these disparate institutions we typically find further subdivisions. In the zoological garden, for example, we will likely find all the bears in one place, then go to another area to see all the cats, or to a Primate House, or a Parrot Hall, or a Reptile Pavilion, and so on.

This categorical tidy-mindedness goes against the grain of nature and is a fundamental problem to which I will return. In the meantime I want to look a little more closely at the phenomenal success which zoos experienced in their early days. London Zoo set the pattern when it opened its doors in 1828.

One can find examples of zoos throughout human history, from ancient China to Rome, and from Solomon to Montezuma. But the zoological garden in Regent's Park was the first of its kind, set in a park and open to the public. Its success was instantaneous, and it was immense. The arrival of the first chimpanzee in 1835 caused as great a furor in the capital as the arrival in 1850 of the first hippopotamus, an event which launched a veritable hippo fever in the nation. (Some of us remember the same media frenzy that swaddled the birth of the baby polar bear Brumas in the 1950's, resulting in record crowds at the zoo). That sort of popularity no longer prevails. But in a time before television or color photos, people just wanted to see such curiosities. How big is an elephant? What colors are macaws? How many spots on a leopard or stripes on a zebra? Visitors to the zoo wanted only to know what these wild animals looked like. That was sufficient for the day.

The success of London Zoo launched a succession of imitators. Throughout the 19th Century, from Philadelphia to Melbourne and all across western Europe, a new zoo was opened almost every year in city after city. Although their popularity is declining in Britain - and once again, incidentally, London Zoo is leading the way - zoos have enjoyed enormous popularity for the most part of their existence.

In many parts of the world, notably North America, Australia and south-east Asia, zoos are enjoying considerable success today. In the United States, zoos attract more visitors each year than all professional sporting events combined (with or without baseball and hockey strikes). North America's 165 zoos accredited by the American Zoo Association (AZA) last year attracted a combined attendance of almost 116 million (Boyd, 1994).
Association of Zoos and Aquariums (AZA), 1992.

The Bronx Zoo, America's most important and influential zoo, not only has the largest collection of animals in the world, but it also serves as a conservation center. The population of the zoo is constantly monitored through various methods and data collection. In fact, the zoo's groundbreaking initiatives, such as the Conservation Action Network, are setting new standards for zoo management and conservation practices.

This crisis, however, raises several important questions about the future of zoos. The increasing demand for exotic and endangered species has put zoos under pressure to adapt. The AZA, for example, has developed a new set of guidelines for zoo accreditation, which includes stricter standards for animal welfare. These changes are expected to have a significant impact on the way zoos operate in the future.

In recent years, I have been working on a new project that focuses on the role of zoos in conservation. The project aims to identify the most effective strategies for preserving endangered species and to evaluate the impact of zoos on the conservation of these species. The results of this study will be presented at the upcoming conference on animal conservation.
Perhaps because the birth of an endangered species at the zoo easily makes a front page photo or a 30 second spot on the nightly News, it is not surprising tonote a recent survey showing that almost 80% of Americans believe most of the efforts to save endangered species has come from work done in zoos (Communications Consortium, 1994).

The combination of seeing animals in larger, more natural looking exhibits, and the comfort of believing that a zoo visit means support for wildlife conservation, makes people much more attracted to zoos.

In truth, however, these two pillars are built on shaky foundations and will not withstand scrutiny. Let’s look first at the new zoo exhibits because, for all their impressive appearances, the improvements are essentially only cosmetic. Typically they do not go much deeper than the semantics which has replaced the word "cage" in zoo parlance with the much more appealing but sadly abused word "habitat."

Far too many of the new zoo exhibits are only superficially attractive. All too often the zoos’ so-called habitats are composed of masses of rockwork that are merely concrete in another form, decorated with trees that are mere simulations, built of epoxy resin, with leaves of plastic or metal, and of absolutely no functional value to the animals. All too frequently the animals are kept away from any live vegetation that may be growing in the exhibit by fences of electrified wires. Even worse, the spaces in which most zoo animals spend the greater part of each 24 hour period - the service areas out of public view - are often exactly the same conditions as the 19th Century menageries: sterile concrete boxes fronted by iron bars and full of reverberating screeches and clanging metal.

Furthermore, the claim that zoos are conservation centers is largely unsustainable. The persistent description of zoos as a latter day Noah’s Ark is especially ludicrous, and was surely coined by the publicity departments, not by any scientists.

Admittedly zoos are, to their credit, actively pursuing success in breeding some rare and endangered species. There are now 69 cooperatively managed Species Survival Plans operated by the AZA, and quite likely almost all of these will sustain populations of species that are undeniably in serious trouble in the wild. But zoos are investing very large sums of money, energy and expertise to save just a few species - animals that are in any case more important to zoos than to nature.

If we look at the composition of the SSP programs we find that 48 of them, or 70%, are for mammals, almost entirely large, exotic, charismatic species; 12 programs, or 17%, are for birds, especially
characteristic after-rain smell (Khanum, 1994). Indians claim that cactus gave their homeland its desert flavor, and that cacti do not grow over other vegetation after rain. The strong smell of the cactus plant is a unique characteristic that cannot be found in any other plant. When it rains, the prickly pear can be eaten, not knowing that the fruit of the prickly pear can be eaten. Moreover, the cactus plant is a source of vitamin C. However, the cactus plant is not as nutritious as the fruit of the prickly pear. Therefore, we also harvested that part of the cactus plant not used for consumption. Although the desertAlice, Jordan, and Lauren have learned some interesting facts about the ecosystem and the unique species found there. For example, the Sonoran Desert Museum is a great place to learn about the flora and fauna of the Sonoran Desert. It is also a great place to see many unique species, such as the Arizona-Sonora Desert Museum, which is one of the largest zoos in the world.
think, Sir Winston Churchill who said that "the people shape the buildings, and the buildings shape the people." There's much truth in this. But of even more importance is that human culture is shaped by the landscape.

That landscape, for most of the people in most of the world, is more and more a landscape of steel, glass, and most especially concrete; an environment of ricocheting noise rather than birdsong, of internal-combustion pollution rather than the scent of grasses, of gutters rather than streams; a world of flat surfaces and the dreariness of modern architectural geometry, instead of the complexity of woodlands and meadows.

It seems ridiculous for us to complain. We built this world, consciously and deliberately. We developed universities to train engineers and planners and architects to create this environment, so that our business operators and administrators and scientists can spend their working lives in it.

The artificial world we have created for ourselves is far removed from anything we have experienced for 99.9% of the time our species has been in existence, apart perhaps from the occasional volcanic eruption or earthquake, which are the closest natural comparisons I can imagine to a rap music concert or a ride on the Underground at rush hour.

Now I readily admit there are untold advantages to living in a heated house with a supermarket and a chemist down the road. Probably less than twenty generations ago my ancestors were living in a hut of sticks and mud with no ventilation, warmth or light, existing on a diet of unvarying monotony, ever fearful of smallpox, muggers and the taxman. Well, some things have improved.

But the world of those recent ancestors also put them into daily contact with important things we've lost: a world of starry nights and long walks over the hills; of intimate contact with little animals in the fields and woods; of a detailed consciousness about the way things grow; of all the subtle complexities of nature which can only be perceived in close and perpetual observation. They lived in a world where you took apples from trees and potatoes from the ground and fish from wild streams.

To be aware of this loss is not just nostalgic romanticism. As we have moved to distance ourselves from nature we have deluded ourselves that we are no longer a part of nature.

Our species has been at odds with nature ever since we devastated the Pleistocene megafauna in various parts of the world, and accelerated as we started our agricultural revolution. The conflict rapidly grew more serious with the advent of the industrial revolution. Now the rate and scale of destruction is such that one might think we were at war with nature; that we wanted to see it
more in the next 50 years, how are we to understand the dangers of losing many thousands of species which have been extirpated by man in the past 50 years, or even exterminated by man in the past 200 years? we are not even comprehending the value of the plants and animals which are threatened and endangered. but if we cannot comprehend the value of the plants and animals which are threatened and endangered, how much more the value of the species which are not threatened or endangered but which are just as important. most people know about a handful of extinct species, such as the dodo, but we have lost in the past and perhaps now are losing many thousands.


in a world of our own, second edition, 1999.

(species loss)

the loss of biodiversity is not only the loss of species, it is the loss of the genetic variation that species possess. the loss of genetic variation makes it impossible for species to adapt to new environments. the loss of genetic variation also makes it impossible for species to evolve. the loss of genetic variation makes it impossible for species to reproduce. the loss of genetic variation makes it impossible for species to survive. the loss of genetic variation makes it impossible for species to thrive. the loss of genetic variation makes it impossible for species to exist. the loss of genetic variation makes it impossible for species to be.

we are exterminating plants and animals at an unprecedented rate.

The next 50 years, how are we to understand the dangers of losing many thousands of species which have been extirpated by man in the past 50 years, or even exterminated by man in the past 200 years? we are not even comprehending the value of the plants and animals which are threatened and endangered. but if we cannot comprehend the value of the plants and animals which are threatened and endangered, how much more the value of the species which are not threatened or endangered but which are just as important. most people know about a handful of extinct species, such as the dodo, but we have lost in the past and perhaps now are losing many thousands.


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Second, most general knowledge about species presently threatened with extinction is limited to just the spectacular and well publicized few that receive so much attention, especially in zoos, such as the tiger, the rhino, the gorilla and the California condor. Yet these represent no more than the glittering tip of a massive berg of life forms sinking into the blackness. Moreover, and this cannot be over-emphasized, the way such species are presented in our zoos reveals absolutely no understanding of the functional roles any of these organisms play in their ecosystems.

The third problem is our general lack of understanding about the complexity of habitats, and the web of connections between the soils, plants and animals, especially the very small ones, within a habitat. Almost 100 years have passed since John Muir reminded us that "When we try to pick out anything by itself, we find it hitched to everything else in the Universe." But today most Americans are incapable of identifying any cause for biodiversity loss; only 8% are aware that destruction of habitats is related to loss of biological diversity (Communications Consortium, 1994).

The fourth issue is our inability to comprehend the scale of deep history. For most of us, human history stretches back no further than about 4000 years. When we developed the ability to perceive annual cycles we gained one of the keys to developing a civilization. During the Renaissance we invented the concept of measuring time in centuries. We now need to go very much further, and take a quantum leap in time perception.

After each of the catastrophic drops in biodiversity in the past—and there have probably been at least five immense implosions in the history of settled life on Earth—nature has always recovered.

Those periods of recovery, however, have sometimes taken 100 million years (Wilson 1993). We are not used to trying to comprehend such time scales. Yet in less than one century we might well reduce the diversity of species to such an extent that it will take one million centuries for evolutionary recovery. We are not just eradicating species, we are wiping out what E O Wilson (1994) calls the "Theaters of evolution"; those natural environments in which evolution can begin to recreate biological diversity.

These monumental changes in the natural environment and the severe reduction in habitats mean that many of the animals and plants now living may as well be considered extinct. They no longer exist as reproducing populations enmeshed with the environments in which they evolved, and they are beyond hope of recovery.

Small and specialized areas give us a warning about what is happening. More than 50% of the freshwater fishes in peninsular Malaysia, for example, are gone. All the tree snails on the island of Moorea are gone (Wilson 1993). Hawaii is on the edge of a
neither should other big, active, intelligent and imaginative

experience have led me to believe that experiences should not be

recreating conceptual primate.

The answer the party in the manner of the harmed, allows

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happier, yet all the advantages of modern veterinary care and a

healthy diet. For it can be a world without the fear of being eaten

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in zoos, and to ask whether we should, even here and nowhere

welfare in zoos, and to ask whether we should, even here and nowhere

are the answer the party in the manner of the harmed, allows

domesticated world for our species. What happened was that those

evacuatedn't happen, and that would have been in the wild, we must compare what

animals' can enjoy a life far better than that some zoos are, and I do not know by what logic go to the

there are difficulties, and those are difficult questions, and the answers are

in captivity. These are difficult questions, and the answers are

at this point it is also appropriate to focus on the question of animal

and endangered species, you would not design a public zoo.

Certain types of animals do not require a home for the protection of acute.

I believe that zoos can ever be effective and conservation cannot be considered by the

Man in the wild in the wild, nor do

generally regard by the manner in which they think of what I do anything to

some small or to see a zoo directly, or to have a

I must admit that I do not like visiting most zoos and I invariably

rather than campaign for their extinction.

Clearly, humans are facing a catastrophic problem, and it never makes

perceptions drop in disparity of native birds and moths, with a

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healthy diet. For it can be a world without the fear of being eaten

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I must admit that I do not like visiting most zoos and I invariably

rather than campaign for their extinction.

Clearly, humans are facing a catastrophic problem, and it never makes

perceptions drop in disparity of native birds and moths, with a
animals such as whales, dolphins, and bears. We simply cannot meet their behavioral and social and psychological needs adequately.

At the same time, however, I believe that the hummingbirds in their aviary at the Desert Museum, as an example, have a life of greater ease and richness than the same species surviving in the surrounding desert. They have food and shelter and care of a quality that enables them to carry out their natural behaviors, to live longer, and to raise more offspring. Though they are admittedly in captivity they have more freedoms than their wild counterparts.

I feel that numerous other species of small birds, reptiles, amphibians, and many of the little mammals can also do extremely well under humane and well designed captive conditions. In particular, too, there is a myriad of smaller life forms — all those beetles, newts, millipedes, crabs, geckos, worms, salamanders, butterflies, scorpions, leaf-insects, toads, snails, lizards and countless others — each equally as fascinating as, say, zebras or lions. Indeed, in an ecological sense, these small life forms are probably even more important. They have behaviors and lifestyles more interesting and illuminating than traditional zoo species. They are invariably more critical to the habitat. Invertebrates, especially, usually have more biomass and thus greater influence, with more vital and direct links to the functions of their ecosystems.

It is more than just ironic that these interesting small life forms are ignored by zoos because, without them, the interpretations that zoos can give about the wild are crippled, and the stories they could tell about maintenance and management of wild habitats are severely compromised.

There are important stories to reveal not only about the life histories of millions of small species, but also even about microorganisms, such as protozoa, tardigrades, rotifers, volvox, or radiolarians. I have always maintained that one could produce a more interesting and useful exhibit about slime molds than about any giraffe. Anyway, it is all these tiny, sometimes minute, life forms that are the best species to display and interpret as examples of the little things that run the world.

But I also know what it is like to try and persuade a zoo to get rid of its charismatic megafauna. In the 1970’s, when I was director at Woodland Park Zoo in Seattle, I proposed removing the elephants from the zoo. Typical of so many "postage stamp" type of zoo collections, the zoo had one Asian and one African elephant, confined to a small dirt yard and a drafty, leaking wooden shed. No one, either human or elephant could surely, I reasoned, be getting any benefit out of this. I anticipated wide support and even a collective sigh of relief from the City. Instead I received abusive
present and explain the interdependencies between all living organisms. We need not just zoological gardens, but parks that we need, therefore, to replace the zoo with an entirely new type of
understanding of why such connections are fundamental.

I never see any of the plant pollinators in the botanical park, do you ever wonder where are the birds and invertebrates? I never think about the plant pollinators. I

holistic view of the natural world.

importance of the natural history. Institutions to recognize the role of natural history in schools and communities, and the impact of the concept of making sense of the

importance of the natural world.

I agree with this view, but I also believe that we need to develop a

importance of the natural world.

institutions to recognize the role of natural history. Institutions to recognize the role of

importance of the natural world.

institutions to recognize the role of natural history. Institutions to recognize the role of

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institutions to recognize the role of natural history.
things; that reveal the complex dynamics of ecosystems; that demonstrate the connections between trees and ants, and flowers and minerals, and soils and micro-organisms, forests and bats, mountains and plankton, moths and papaya and spiders and hummingbirds, and all the fascinating stories linking the components of our natural world. These are vitally important messages to convey.

The collective failure of our natural history institutions is a sin that will fall heavily upon the next generation. The inadequacies of our zoos have perpetuated false images in the past, and continue to convey wrong perspectives to the present generation. We are failing to teach the basics about what our planet is and how it works.

The amount of stress and destruction that is being placed on the world's ecosystems is occurring at a rate far in excess of anything similar in human history. If that story is to be told, and understood, we cannot hope to do it in the piecemeal fashion dictated by our present disparate natural history institutions, whereby zoos deal only with a small part of the animal world, and botanic gardens deal only with plants, and aquariums look only at aquatic life. This technique is a remnant from a past era.

Presenting little bits of the picture in different types of institutions has not worked, and cannot work. We have a scale and pattern of ecological illiteracy that is frightening. Yet millions and millions of people visit our museums and natural history gardens each year, some with open minds, thirsty for knowledge, craving contact with and better understanding of the "other world" of nature. Our increasingly urbanized populations could gain strategically critical contacts with plants and animals, learn new insights, develop new attitudes of respect and concern.

To achieve this, we need a new type of institution for the new Century. We need to develop Gardens of Biology; places that will reveal the network of intricate connections; that will offer a healing vision in our lunatic postmodern world; that will remind us, as John Muir said, that "We all live in a house of one room."

Multi-talented men and women of great vision and energy and optimism created the zoological and botanical gardens and natural history museums. We should emulate their zeal.

I fear that tradition, politics, and the tyranny of institutionalized territory will combine to prevent the radical changes that are needed for the 21st Century. If that happens, those 18th and 19th Century pioneers won't thank us for clinging jealously to their ideals. Worse, neither will the yet unborn generations.
December 1994
2011 North Kinney Road, Tucson, Arizona 85744
David Hance, Executive Director

Arizona-Sonora Desert Museum

A desperate need to understand the world and our place in it. Generations of Victorians who made even more than us, will be
and of most astounding value, it will bring untold benefits to future.
It will eventually bring greater intellectual rewards, beyond all,
greater intellectual challenges for the professional, commonplace,
towards revealing the stories about the world of nature which bring
understanding, the extra dimensions of taxonomic groupings and the more
The subject away from just exhibiting species - spectacular in the

The beauty of disparity. Frankly, we have little alternative. We face an alarming future,
and presently have only inadequate and cumbersome tools to deal
with it.

At first, we can design places that show the stories of our communities,
and their interactions and their plants, their animal habitats, and their
development of plants. We can do the same in the 2000's, we can conceive
our great land. We can do the same in the 1980's and early 1990's. But it must have
It could be even easier to establish new botanical and
Appendix D

Listing of Habitat Typologies
Included in The Plains and The Forests

Modeled after the
Healesville Sanctuary Master Plan
Zoological Board of Victoria, Australia
Appendix D

The Plains

Exhibit Name: World of the Platypus

Core Species:
Platypus
Water Rat

Habitat: Open Flood Plain

Interpretive Level: High

Exhibit Type:
The exhibit is to be a highly atmospheric total habitat exhibit. This allows for the display of related creek species including fish, crustaceans and notably, Water Rats.

The exhibit provides an excellent opportunity to convey total habitat understandings to the visitor to relay interrelationships of species within ecosystems.

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Exhibit Name: Kangaroo Tales

Core Species:
Kangaroo Island Kangaroo
Red-necked Wallaby

Habitat: Open Flood Plain

Interpretive Level: High

Exhibit Type:
This area is to contain comprehensive information about kangaroos - species identified as holding high fascination to visitors although not well understood. Static and interactive graphics to be provided, situated to the adjacent controlled contact area.

The visitor will also have the opportunity to experience macropods demonstrating a range of movements and abilities. The space is to incorporate a public address system and visitor seating. The species represented are chosen on the basis of their potential to provide close viewing in a controlled setting. The experience will include photographic opportunities and contact under supervision.
Appendix D

The Plains Aviary

Exhibit Name: Bush Birds

Core Species:
- Superb Blue Wren
- Eastern Yellow Robin
- Diamond Firetail
- Golden Whistler

Habitat: Dry Chaparral

Interpretive Level: Medium

Exhibit Type:
The exhibit is composed of a variety of small, colorful birds displayed in a highly atmospheric walk-by exhibit context.

Exhibit Name: Reptile Encounters

Core Species:
- Gippsland Water Dragon
- Tiger Snake
- Copperhead Snake

Habitat: Open Flood Plain

Interpretive Level: High

Exhibit Type:
This exhibition space is to be designed as a series of pass-by spaces via the main circulation path with nodes of educational exhibits adjacent.
Appendix D

The Plains
Immersion

Exhibit Name: Grasslands

Core Species:
Red Kangaroo
Wombat
Emu

Habitat: Open Flood Plain

Interpretive Level: Low

Exhibit Type:
The exhibit is to be a highly atmospheric walk-through immersion exhibit context. Adjacent to the primary circulation path will be a wombat burrow with the grassland exhibit as a backdrop.

Exhibit Name: Tasmanian Devils

Core Species:
Tasmanian Devil

Habitat: Open Flood Plain

Interpretive Level: Medium

Exhibit Type:
This exhibit is a pass-by exhibit of Tasmanian Devils in a habitat which simulates what is natural. The exhibit may be viewed from the main circulation path.
Appendix D

The Plains Immersion

Exhibit Name: Woodlands

Core Species:
- Grey Kangaroo
- Emu
- Regent
- Parrot
- Blue-faced Honeyeater

Habitat: Open Flood Plain

Interpretive Level: Low

Exhibit Type:
This walk-through exhibit offers visitors the opportunity to view Eastern Grey Kangaroos and Emus in a highly habitat focused space. To distance the visitor from the animals, the visitor will be elevated above the animal in the immersion exhibit along a foot path corridor of a canyon wall.

The habitat zone is to include an aviary limited to species which would occupy such habitat to enhance the naturalistic atmosphere. The interpretive level is low so as not to diminish the habitat messages to be implicitly conveyed to the visitor.

Forest Fringe

Exhibit Name: Forest Fringe

Core Species:
- Wombat
- Echidna
- Grey Shrike Thrush
- Satin Fly Catcher
- Swamp Wallaby
- Emu

Habitat: Swamp Community

Interpretive Level: Medium

Exhibit Type:
After traversing the marshland, the visitor enters the Forest Fringe which represents a swamp community. This habitat zone is to also include an aviary with the stocking policy to be that which best represents the species characteristically occupying such habitat.
Exhibit Name: Habitat Aviary

Core Species:
- Orange-bellied Parrot
- Eastern Bristlebird
- Plains Wanderer
- Helmeted Honeyeater

Habitat: Swamp Community

Interpretive Level: Medium

Exhibit Type:
This exhibit will provide an aesthetic display of birds and plants, as well as informing visitors about the interdependence of threatened birds and habitats. The habitat aviaries will be relevant to south-eastern Victoria.

Other Habitats to be represented:
- Coastal Heath
- Grassland
- Riparian
- Scrubland
- Wet Chaparral
- Woodland

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The Forests

Exhibit Name: Creatures of the Night

Core Species:
- Tiger Quoll
- Long-footed Potoroo
- Leadbeater's Possum

Habitat: Dry Chaparral

Interpretive Level: High

Exhibit Type:
The core species prescribed reflect an emphasis on the display of endangered and threatened species. The exhibit is to be a highly atmospheric walk-by exhibit context.
Appendix D

The Forests

Exhibit Name: Koalas

Core Species:
   Koala
   Swamp Wallaby
   Echidna

Habitat: Open Flood Plain
         Swamp Community

Interpretive Level: High

Exhibit Type:
The exhibit will be a pass-by exhibit with close proximity viewing. Major emphasis is to be placed on the provision of high quality, high level interpretive experiences.

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Core Species:
   Brolga
   Magpie Goose
   Cape Barren Goose

Habitat: Swamp Community

Interpretive Level: Low

Exhibit Type:
The exhibit is to recreate a marchland setting with the inclusion of secondary species such as the Brush-tailed Rock Wallabies and Wallaroos.
Appendix D

The Forests Immersion

Exhibit Name: Forest Fringe

Core Species:
- Wombat
- Echidna
- Grey Shrike Thrush
- Satin Fly Catcher
- Swamp Wallaby
- Emu

Habitat: Swamp Community

Interpretive Level: Medium

Exhibit Type:
After traversing the marshland, the visitor enters the Forest Fringe which represents a swamp community. This habitat zone is to also include an aviary with the stocking policy to be that which best represents the species characteristically occupying such habitat.

Exhibit Name: Forest Canopy

Core Species:
- Lace Monitor
- Gang-gang Cockatoo
- Yellow-tailed Black Cockatoo
- Brushtail Possum

Habitat: Riparian

Interpretive Level: Medium

Exhibit Type:
The visitor will be part of a spectacular experience of the gums and tree ferns of a riparian corridor which will take the visitor along a walkway 4-5m above ground level. The visitor will also have glimpses of important arboreal species, including nocturnal species sleeping during the day.
Appendix D

The Forests
Immersion

Exhibit Name: Southern Rainforest

Core Species:
- Fruit Bats
- Brush Turkey
- Pademelon

Habitat: Riparian

Interpretive Level: Medium

Exhibit Type:
The exhibit is an immersion type exhibit with a walk-through aviary. The animals displayed will include arboreal and terrestrial species to provide a multi-level attraction.

Immersion

Exhibit Name: Billabong

Core Species:
- Pelican
- Brolga
- Magpie Goose
- Grey Kangaroo

Habitat: Swamp Community

Interpretive Level: Low

Exhibit Type:
The exhibit is to be of the immersion type with animals glimpsed through vegetation rather than openly displayed. Free-ranging species will also be included to add to the natural feel (birds in particular). The amount of interpretive materials is to be kept low.