Natural Habitat Exhibit Design

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Introduction

At the outset it is important to realize the difference between natural habitat design and naturalistic habitat design. Most zoos in 21st century South Asia have made or are trying to make the transition from menagerie-cage exhibit types to open-moat enclosures (pioneered by Carl Hagenbeck almost 100 years ago) where a more naturalistic habitat can be created. Naturalistic habitat design involves the creation of an animal habitat with natural components - grass, trees, bushes, and rocks, as the main features and not human made features such as concrete floors and bars of steel. While such exhibits have greatly improved conditions for animals as well as the viewing experience they still have to be developed further before they can be termed 'natural habitats'. At worst naturalistic exhibits are in the words of internationally renowned zoo designer Jon Coe – "safe, familiar, and predictable" with artificial rockwork, large moats and neat hedges – still leading to the primary message as with menageries - that "wild animals live at the zoo". 1

By comparison, the design and execution process for natural habitat design involves mimicking and/or recreating the actual natural habitat of the species. As Jon Coe describes it – "Visitors walk along narrow pathways through a rugged looking landscape of overhanging trees and dense herbaceous growth, immersed in a simulation of the animals' natural habitat….every effort is made to remove or obscure contradictory elements such as buildings, service vehicles, large crowds of people, or anything that would detract from the image or the experience of actually being in the wilderness".2

Communicating the message – conservation through education

Studies by zoo researchers have shown that zoo visitors spend a short time actually viewing exhibits. The reasons, according to Jon Coe, may be due to a lack of appropriate stimuli such as those associated with fear and pain, which make the exhibits less than interesting.3 He posits that by making the zoo visit memorable through experiences that incorporate the elements of drama, mystery, and sequentially staged *personal* experience, the educational message is bound to have more impact and retention in the minds of the visitor. This indeed is one of the primary objectives of 'landscape immersion' design in zoos - described later in this article, a method practiced successfully for several years by specialist zoo design offices around the world.

Natural Habitat Design

Natural habitat exhibit design is centred around the concept of landscape immersion, which depends greatly on natural plantings that mimic a wilderness. The phrase 'landscape immersion' was coined back in 1976 by one of the pioneering offices in natural habitat zoo design – the Seattle based Jones & Jones and describes exhibits in which the visitors share the same created landscape, but not the same areas, as the animals4. The objective behind 'landscape immersion' is to give the viewer a sense of being in the landscape of the animal rather than outside it – to make the experience more real. According to Jon Coe, the larger goal is that by making the experience thus dramatic and exciting, it may become a part of the long-term memory of the visitor. Also, the image thus created of wildlife living undisturbed by humans would hopefully render the visiting public more conducive to education and conservation-related information. Indeed, surveys of zoo visitors' abroad have shown that experience of immersion exhibits leads to greater appreciation of ecology and conservation.

From the point of view of the zoo staff, important advantages of natural habitat design would be in permitting animals' greater freedom of movement, with minimal hoof disorders, leading to their better health. Animals in simulated native habitats also display normal behavioural patterns, natural feeding habits, as well as natural playing behaviour, leading to less strain and therefore easier keeper management. Social relationships between animals are enhanced leading to natural sexual behaviour and mating resulting in healthy reproductive lives. All these animal activities are also perceived by the visitors, thus underlining the importance of the conservation of natural habitats.

The process of natural habitat design can be divided into two major interrelated parts – the conceptualization of the natural habitat representation and the process of integrating the habitat design with the landscape immersion concept in all it's aspects from layout to barrier design to selection of planting. In the case of a new zoo the habitat type scenario will also determine the most appropriate location in the zoo master plan for each type of exhibit based on the critical components required for the habitats.

Conceptualizing natural habitats

The habitat type to be represented is completely dependent on the species in question and there are roughly four major environment types in which habitats occur. These are:

Aquatic – riverine, pond, marsh, estuarine (underwater, over water, split-surface)
Terrestrial – jungle/woodland, scrub-land, meadow/grassland, desert (grazing, climbing)
Arboreal - jungle/woodland (upper canopy / lower canopy / trunk dwelling)
Flying - jungle/woodland, scrub-land, marsh

Within the environment type, the process of evolving habitat type representation involves studying the animal's natural habitat and analyzing it for the critical components:

Topography – flat, rolling, hilly, cliffs
Rock formations – scattered, continuous, igneous (kopje), metamorphic, sedimentary
Water features – marsh, pond, stream, waterfall

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Vegetation - groundcover, shrubs, trees, vines
Natural artifacts – lianas, termite mounds, buttress trees, deadfall
Cultural artifacts – granaries, village huts

Ideally an exhibit scenario should be invented (or mimicked from an actual location) which combines the relevant elements above into a believable natural scene. This process of exhibit scenario development was in fact successfully carried out for the establishment of the Coimbatore Zoological Park where staff scientists identified 26 locations in wilderness areas from the region that could be used as models for habitat simulation.5

Integrating habitat design

Once the habitat representation for an exhibit or group of exhibits has been determined, the concept needs to be integrated with the landscape immersion experience, which includes the adjacent visitor areas and thus includes other design elements such as:

Barrier types – moats, fences, walls, net structures etc – the attempt should be to make these disappear into the scenery as far as possible, i.e. barriers are meant for protection – not to be seen.
Screen types – walls, fences, planting to conceal all service and support features that distract from an exhibit scenario
Viewing / rest structures - (open, covered, natural materials) to thematically match the exhibit scenario
Walkways – boardwalks, forest paths, bridges, view rails, guard rails – the materials to mimic paths in wilderness areas
Holding structures – masonry, lightweight, enclosed, open-air – the design to provide the best combination of protection, servicing and ability to blend into the vegetation
Exhibit servicing – vehicular, keeper only – to be concealed from visitor areas
Horticulture – thematic conceptualization and plant selection process to simulate the exhibit scenario, using plant species adapted to the climate of the zoo location

Arguably this is the most important aspect of natural habitat design and vegetation planning can be used to effectively improve even existing exhibits.

Principles common to natural habitat design

As discussed earlier the final exhibit image representing the natural habitat depends on the species being designed for. However, some of the salient features common to all natural habitat design are summarized thus:

Larger habitats are not necessarily better – with very large habitats animals define their own sub-territories, which may be distant from viewing areas. The visitors don't get to see the animal and the opportunity for an interpretive experience is lost.
Quality habitats are what matter - Interesting and varied habitats with undulating – not straight - edges are created to help combat animal boredom. Naturalistic pools, waterfalls, high contours, perching rocks and dead trees that are found in nature encourage animals to display their natural behaviour apart from creating an impression of a real habitat.
Predator exhibits are usually placed at a location higher than the viewer unless the interpretation requires them to be lower (as in semi-aquatic exhibits). This reduces the sense of human domination and increases the level of excitement through the perceived threat to the visitor.
Viewing areas never encircle the animal as in a traditional zoo. This removes the sense of domination and circus-like atmosphere around the animal, which feels as if it's on a dinner plate. Viewing areas are often hidden from the main path and from each other to create a 'safari-like' experience.
Animal barriers are hidden from the pathway through careful manipulation of earth levels, views, rockwork, and vegetation. This is critical to make the visitors feel that they are in the animal's natural habitat.
Inter-species interaction and the resultant behavioural enrichment is also created by mixed habitats where possible such as hoofstock, land birds and large aviaries. Where species are part of a natural prey-predator relationship, locating habitats in relative proximity to each other so that the animals are always aware of each other's presence leads to more alert behaviour.
Use as many types of habitat-appropriate species of vegetation to mimic the animal's natural habitat – both inside and outside the exhibit.

Executing Natural Habitat Designs

Critical to the success of a natural habitat design is the process by which it is made. Standard construction in South Asia of any type requires only a set of blueprints along with Specifications and a Bill of Quantities. i.e, there is no visual / descriptive component to the contract package. Nearly all zoo exhibits in this part of the world are constructed in this manner which is why they look the way they do - moats usually resemble concrete bathtubs, exhibit floors resemble concrete parking lots and rock walls resemble the cartoon-like hills in children's comic books.

Natural habitat design requires visualization - and a lot of it at that. Tender documents for exhibits involving natural habitat design must include photographs of the actual habitat / structures to be simulated. For instance the contract for a Nilgiri Tahr exhibit would include photographs of the rocky Nilgiri hills, while visitor shelters for the same exhibit would perhaps be constructed with the help of photographs of Toda tribal huts. Photographs are accompanied by extremely detailed drawings - every component, be it a rock cliff, stream is drawn and detailed out by the exhibit landscape architect / architect. As site rockwork artists design and sculpt the exterior surfaces from the photographs provided while specialist craftsmen may be required to build themed structures in bamboo and wood. In essence, the natural habitat design and construction process goes way beyond the standard construction process, but the end result is worth it in the richness of the habitat created for the animal and the experience created for the visitor.

References:

1 Coe, J.C., 1996. *Whats the Message? Education through Exhibit Design*. pp 167-174 in Wild Mammals in Captivity, ed. D. Kleiman & others.The University of Chicago Press.
2 *Ibid*
3 Coe, J.C. 1984. *Design and Perception: Making the Zoo Experience Real*. Pub. Alan R. Liss Inc.
4 Jones, G.R., Coe J.C., and Paulson, D.R. 1976. *Woodland Park Zoo: Long range plan, development guidelines and exhibit scenarios.* Jones & Jones for Seattle Department of Parks and Recreation.
5 Ashraf, N.V.K., and Gupta, B.K. 1995. *Exhibit Scenarios from the Nilgiri Biosphere Reserve.* Technical Report-2, Coimbatore Zoological Park & Conservation Centre.