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Deep Green Design for Zoos and Aquariums

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Introduction

“Ultimately, the goal of sustainable landscapes is the transformation of culture – the taming of technology, the emergence of a new environmental ethic, a new measure of life quality, and a substantially broadened sense of community including not only humans, but all of life.”
Robert Thayer (1994).

In the early 1970's Norwegian philosopher Arnie Naess coined the term *deep ecology* to describe a deeper relationship between humanity and nature, one based upon an *ecocentric* rather than an *anthropocentric* view of life (Atkisson 1989). While seeking to bring a similar perspective to zoo exhibit design (Coe 1987), I became concerned with what I viewed as a widespread superficial, technological, even anthropocentric approach to green design.

Where is the green heart of green design? Are we focusing too narrowly on the technology, the means and methods of green design, to see the obvious connections we could make to nature? Has green design been redefined as simply an engineering problem? American architect James Wines (2000) summarized the problem in his book *Green Architecture*:

“There is already a danger that technological obsessions are distracting designers from understanding their place in the larger picture of interconnectedness...a more balanced objective now is to view environmental technology as a valuable tool kit, and natural science as a primary source of inspiration. ...for architects to interpret today's environmental advocacy exclusively in terms of mechanical hardware and conservationist databases – without including the vastly more interesting

sources of imagery found in nature – is to miss an extraordinary opportunity.”

I once began a lecture on sustainable design by asking the audience, “*You know that scum that grows on your bathroom curtain and between the tiles, that scum you spray and scrub with harsh household chemicals to remove? That scum is the first stage of plant succession. If you left that scum alone long enough, your bathroom would become a forest!*” What if, instead of fighting natural succession with arsenic and copper-treated timber and lead-treated paints we designed our habitats to encourage natural succession, even giving it a head start? What if instead of building green roofs a few centimetres thick we designed buildings to support forests on their roofs and walls, forests which produce oxygen, fix atmospheric carbon and filter effluent, that create humane habitat for wildlife as well as zoo animals and people? Why not follow Thayer’s advice and create deep green communities in our zoos for the benefit of a diversity of free-living as well as captive species?

In assessing the progress of sustainable technology, respected American social researcher Stephen Kellert made the following observation:

“Yet I believe much of this progress has unduly relied on a largely negative emphasis on avoiding environmental harm and injury, a stress on physical and material benefits, and changes more at the level of building systems than at the experience of individuals and groups. By contrast, I believe sustainable design has insufficiently considered how people derive a host of intellectual and emotional, as well as physical and material, benefits from connections with natural process and diversity. I conclude by suggesting green development will not achieve its full promise and potential until it more positively motivates individuals, developers, and planners by capturing in the built environment the widest range of physical, emotional, and intellectual values of nature.” (Kellert 1999)

Zoos as Green Models with Green Roofs

Zoos and aquariums, with their loudly professed commitment to nature conservation and their high visibility, make ideal venues to develop, test and

display the latest in green design. Zoos have long provided models for architecture as an armature for living systems. Nearly one hundred years ago Carl Hagenbeck had living landscapes on his German zoo roofs. There are many examples of ‘buried buildings’ in zoos, such as the elephant facility at the Emmon Zoo in Holland. Examples in the US include the Denver Zoo Pachyderm House and the big cat display and administration and education centre at the National Zoo. A recent example is the “Wolf Woods” exhibit viewing pavilion at Chicago’s Brookfield Zoo.



Living walls on display buildings, Northern Trails exhibit, Woodland Park Zoo. Photos: L. Sammons

Living Walls

Several American zoos such as Brookfield Zoo (IL), along with Woodland Park Zoo (WA), Seneca Park Zoo and the New York Aquarium (both in NY) have outdoor living walls up to 5 metres high and the National Zoo (DC) and Central Park Zoo (NY) have indoor living walls twice this height. French designer Patrick Blanc has developed living walls up to 30 metres high at the Pershing Hall Hotel in Paris which features 300 species of plants, supported by a hydroponic irrigation and drainage system (Jones 2002).



Living wall at Amazona exhibit, National Zoo, USA. Photo: J. Coe

Living Roofs and Walls as Biofilters

As early as the mid 1980's I suggested a 10 metre high living wall system for recycling water from a large manatee aquarium through overhanging rainforest cliffs. The project was never realized, but, like Blanc's proven projects, it suggests the use of living roofs and living walls as bio-filters for treating grey water and perhaps even human and other animal effluent.

Campus Ecology

Individual green exhibits and building are a good start, but we should think of what zoo planner Gary Lee of CLRdesign Inc. terms *campus ecology*. How can we make our zoo and aquarium campuses more self-sufficient, producing energy, capturing rainwater, recycling grey water and returning our 'used water' in pristine form to local streams and wetlands. Victoria's Open Range Zoo in Australia is completing a vast hippopotamus exhibit using living reed beds as bio-filters.

Habitats for Free-ranging Animals

Australian naturalist Tim Low (2003) points out in *The New Nature*: “Nature is not a separate domain hiding away in the wilderness. Animals and plants live all around us and exploit us when they can.” Why not encourage this complimentary relationship? Why not design all buildings to be homes for barn owls, possums, squirrels and songbirds from the beginning? Why not have clear tube raceways for free-ranging squirrels to traverse our exhibit galleries and board rooms?

Humane Design

While we consider the value of integrating the lives of plants, animals and people, we must also consider humane aspects of design and operation. We can develop innovations far superior to regulated standards, not because we have to, but simply because it brings us joy to do so. If we are to teach respect for nature (and some would argue this is the primary function of zoos and aquariums), we must present nature respectfully. And ‘nature’ includes the wild places we represent in our exhibits, our building site and our plantings and animals, and also our guests, our staff and ourselves; all need to be nurtured by the “...intellectual and emotional...benefits from connections to natural processes and diversity” as Kellert (1999) advises, “...by capturing in the built environment the widest range of physical, emotional and intellectual values of nature.” We need a deeper design philosophy if we are to sustain a well-balanced naturally and socially enriching system, a deep green system.

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Additional Reading:

Coe, J. (in press), "New and Sustainable Directions in Zoo Exhibit Design", *Wild Mammals in Captivity*, ed. D. Kleiman, Univ. of Chicago Press, Chicago, additional reading on green design in zoos.