Possible new directions for developing botanic gardens

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Introduction

We live in an age that has little regard for the world. We are in the midst of one of the most serious biodiversity crises seen over the past 600 million years. Our actions constantly and cumulatively destroy it. We cut down, burn the tropical rain forests, and pollute the atmosphere, rivers, lakes and oceans. We destroy coral reefs through dynamite and cyanide fishing, cut down and fill-in mangrove forests and wetlands.

Much of our actions in this systematic destruction stem from ignorance and apathy – combined with over population and poverty – diverting human efforts into the pressing business of staying alive.

Against this backdrop it is interesting that zoos are seeing a dramatic shift in their fundamentally perceived raison d'étre. In the past, the three pillars of conservation have been ranked according to their levels of priority as follows:

- Ex-situ
- In-situ
- Conservation awareness

However, the zoo community has realized that we have a critical part to play in raising conservation awareness. This is because globally zoos play host to 600 million visitors annually and botanical gardens – to 200 million. This has affected the way in which zoo exhibits are now planned and developed. Some of these concepts in zoo design can and should be adopted by botanic gardens.

Development of New Exhibits

Why Plan a Collection?

There are several reasons to plan a collection, either live animals or plants. The more important are as follows:

- To give a theme for the visitor experience
- To make the most effective & efficient use of the spaces in the gardens
- To help shift attitudes in guests about the current biodiversity crisis
- To create new ideas and directions in botanical displays

Unique Selling Propositions

A Unique Selling Proposition (USP) is a marketing term which involved creating a strategic advantage over competitors in the product market place. USPs in zoological gardens are displays that attract people to make a visit. Thus they may be a new and US$65m Bronx Zoo's Congo Exhibit or a US$10,000 Naked Mole rat exhibit in a small country zoo. Either way, they have the desired effect of drawing the crowds because they offer a USP over the competition (other parks, cinemas, video games, shopping malls etc).

When reviewing a collection, be it animal or plant, it is useful to weigh the importance of maintaining or deleting certain displays in the collection in relation to:

- The recommended space they require vrs their operating costs
- The space a *truly great display* requires (which is different from recommended space or minimal requirements)
- The intangible contribution such *truly great displays* make to the attractiveness of the gardens to regular & potential visitors
- The Unique Selling Proposition value of such truly great displays

Difference Between Animal and Plant Collections

Fundamentally, there is not a difference between animal and plant collections. Animals can be shifted, if necessary. So can shrubs, annuals & aquatic plants. Once a tree is planted, it is all but permanent. However, some animal exhibits are permanent, being made of reinforced concrete. Some are so bad that they need to be blown up!! Aquariums are inflexible once built. Museums are flexible internally, but are contained in buildings.

The permanency of trees affects the mentality of the layout. Arboretums tend to be laid out on taxonomic lines. Sometimes based on simply where the Director decided to plant the seedling! Once laid out - they tend to stay that way. There in lies the problem.

Moving Away from Taxonomic Displays of Plants

Botanic gardens have always offered other types of exhibits, other than plants, ranging from waterfowl in their lakes, fish in aquatic plant displays, peafowl and sculptures in their grounds, to band performances and concerts.

Childhood Dreams – sculpture of willow branches at Desert Botanical Gardens, Phoenix

Missouri Botanical gardens Butterfly House

As with several botanic gardens in the past, the Missouri Botanical Gardens added a butterfly house to their collection in 2000, offering native and tropical habitats for the butterflies.

There have been some attempts at deviating from the largely taxonomic layout of botanic gardens over the years. In 1994, Kew Gardens converted an existing green house into an interactive exhibition showing the evolution of plants.

RBG Kew - Evolution House

The Singapore Botanic Gardens introduced the 1.5-hectare Evolution Garden in 2006 which, like Kew's exhibit, tells the evolution story of plant life on Earth throughout the ages.

Replica of the ancient Lepidodendrons or giant club mosses at the Singapore Botanic Gardens Evolution Garden

With the emphasis in botany moving towards conservation, existing glass house structures are not large enough to allow the study of populations of plants rather than individual species. This study of populations is important in understanding of sustainable development and plant bio-diversity. The new and bold Eden Project came into existence, the world's largest biome which is a showcase for bio-diversity and human dependence upon plants. It encapsulates four climatic regions: rainforest, semi-desert, sub-tropics and Mediterranean, a showcase for global biodiversity and human dependence upon plants.

The Eden Project

The Eden Project, inside

New Possibilities

Besides the need to develop new themes, we also need to review the way we do things. For instance in deserts, when day temperatures are too high for visitation, it is more sensible to have a botanic gardens that opens at night and focuses on night exhibits, restaurants and activities.

The ultimate development would be the Biopark – a combination of the best display techniques of botanic garden, zoological gardens, aquariums, natural history, geology & anthropology museums and theme parks to develop a facility that conveys powerful environmental conservation messages. The Biodome in Montreal is an example of the first, albeit simplistic, development in this the direction.

Global Strategy for Plant Conservation

Global Strategy for Plant Conservation (GSPC) sets the following targets:

- Understanding & documenting plant diversity
- Conserving plant diversity
- Using plant diversity sustainably
- Promoting education & awareness about plant diversity
- Building capacity for the conservation of plant diversity

One of the major *problems* with the GSPC targets is that it understates the role that Botanic Gardens should play in environmental conservation. Shifting attitudes and changing mindsets are paramount in the struggle against environmental destruction.

The Need to Shift Attitudes

Education in botanic gardens is often interpreted as a rather fuzzy mixture of plant labels, publications and talks to visiting school groups. However times and needs are changing. Zoos have gone through a reawaking of the need to address current issues such as the international biodiversity crisis that the world is experiencing. There is a need to both engage and create awareness in the visiting public.

This need to create awareness and change mindsets – quickly - has led to a serious re-think as to the way we present our scientific material to the visitor. In zoos the days of taxonomic displays of animals has long gone, being replaced by thematic displays which offer an understanding of the diversity of ecosystems and the consequences of their destruction. However up until now we have squandered this opportunity dwelling on simplistic education messages – if at all.

We have both the opportunity & the moral responsibility to shift our guests attitudes about the international biodiversity crisis. There is a pressing need for us to both engage and create awareness in their guests.

Thus the focus of botanic gardens should shift from a central focus on the collection to an additional focus on interpreting the environment for visitors: exciting & inspiring. This can be achieved through developing a strong storyline for the whole visitor experience and reinforced by key messages around the gardens. To change mindsets one needs to:

- Entertain
- Engage
- Educate
- Empower

The latest trends in zoos are the development of a storylines and key messages: such as Evolution; Extinction – Loss and Recovery; Interdependence; and Life on Earth. These storylines and key messages can be developed around the gardens through a range of display techniques for exhibits such as: landscape immersion; cultural immersion; and journeys to wild places.

The need to engage the visitor has its roots in public perception and touches on branding and image; marketing; strategic partners and commercialization. The development of the many business opportunities offered: restaurants & cafes, high quality retail, partnering with art and music festivals, events and the like.

Why Have a Storyline?

There is a pressing need to rethink the way we present conservation messages to our visitors. The role of conservation awareness is to:

- Interpret living collections
- Inspire & enable people from all walks of life to act positively for conservation
- Explain human impact on wildlife in both local and global contexts

- Change mindsets in visitors about environmental conservation through delivering a series of effective and impactful conservation messages

The Storyline

The storyline should be an all-embracing story that is woven in a variety of messages throughout the park. These messages should focus and refocused to reinforce the story. The storyline and messages should use a variety of techniques to tell the story which will vary from the exhibits themselves, to various aspects of exhibit interpretation (graphics, video, live presentations & printed material).

The storylines could cover such all embracing concepts as:

- How Life on Earth Evolved - The Big Bang
- How Geology Affects the Course of Evolution - Plate Tectonics & Super Volcanoes, Meteorites & Tsunamis
- Extinction – Loss & Recovery
- Natural Selection
- Interdependency – the inter-relationship between life and the solar system
- Saving Ecosystems

Living fossil - Wollemi Pine discovered in 1994 near Sydney

Delivering the Message

Educators & interpreters are essential members of exhibit development teams. Their analytical approach can help mold the volumes of information into effective conservation messages. As story teller's they can use their expertise in:

- Defining audiences
- Selecting methods of exhibit interpretation
- Careful crafting of conservation messages
- Introducing a range of experiential methods of achieving this

How We Deliver the Message

We currently deliver the message through:

- Graphics
- Audio/visual effects
- Printed material

- Docent stations for interpretation
- Trained staff to interpret exhibits
- Docent Kits
- Landscape Immersion
- Cultural Immersion
- Interpretational Exhibits

The Message

The predominant messages should emphasize the causes of extinction such as:

- Slowly Killing the Planet
- Depletion of Biodiversity
- Alien Species
- Cities Are Unnatural
- Destruction of the Environment
- Pollution
- Over Population & Poverty
- Depletion of Resources
- As the 3rd World Meets the 1st World

Four of these messages are elaborated upon below.

1. Slowly Killing the Planet

The Living Planet

There is a pressing need to increase our biocapacity – biologically productive area. Biocapacity is the planet's capacity to maintain its biological productivity & ecological services. There is a need to protect, conserve and restore ecosystems & biodiversity.

Photosynthesis Ceiling

The photosynthesis ceiling in a measure of the sunlight falling on crops, plantations, golf courses and cities etc. We have already utilized 50% of the planets Photosynthesis Ceiling. As we use up more sunlight, there will be less to support natural ecosystems.

Global Ecological Footprint

The Global Ecological Footprint is a measure of Nature's ability to renew its resources. It is the total area required to:

- Produce food & fiber
- Absorb the waste from energy consumption
- Provide space for infrastructure

The Ecological Footprint changes with:

- Population size
- Average consumption
- Resource efficiency

Earth's Biocapacity

The Earth's Biocapacity is presently 11.3 billion global hectares (g.h.) or ¼ earth's surface that works out at 1.8 hectares per person. In 2001, the Ecological Footprint was 13.5 billion g.h. or 2.2 g.h. per person. This meant that the Global Ecological Footprint exceeded the Biocapacity by 0.4

We are thus spending or utilizing Nature's Capital faster than it can be regenerated.

2. Environmental Destruction

We live in an age which has little regard for the world. Our actions constantly & cumulatively destroy it. Environmental destruction results in:

- Pollution - seas & rivers
- Pollution of atmosphere

Which is caused by:

- Over population

- Lack of education
- Poverty

One of the most important is unsustainable logging of rain forests that contain 50% world biodiversity. It is estimated that by the year 2020 all the rain forest in South East Asia. This is in addition to 70% of its coral reefs – the largest cachet in the world through dynamite & cyanide fishing in coral reefs. In addition, the filling in of mangrove & wetlands that besides a nursery for fish, prawns and crabs, have taken on a new meaning as tsunami breaks. Its is now also realized that wetlands act as a gigantic storehouse of carbon, holding it from releasing into the atmosphere.

- Empowerment
- Source timber from sustainable sources
- Donate money to NGO's that purchase land/Debt for Nature to create national parks
- CI, WWF & The Nature Conservatory

3. Poverty & Over Population

Poverty and over population are probably the two main contributing factors to the environmental crisis. Based on the exponential growth of the human population, the world's population is anticipated to grow from the current 5.6billion to 8.2 billion by 2050. The development of food and water reserves do not increase at an exponential rate, thus the pressure this population will place on the planets resources - its biocapacity - will strain it severely.

One of the main problems is that humans live in cities that require concentrations of food, water and energy. In turn, they need to dispose of garbage, human waste, grey water and air pollutants. Cities cover only 2% of earth's surface but account for:

- 78% carbon emissions
- 60% residence water waste
- 76% wood for industry

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Over population leads to poverty which is multi-dimensional deprivation:

- Hunger & under-nourishment
- Dirty drinking water
- Illiteracy
- No health care
- Social isolation
- Exploitation

4. As the 3rd World Meets 1st World

As the 3rd World moves towards the 1st World living standards, there will be colossal impacts on the planets resources. India and China alone with 2.2 billion people attaining affluence in the foreseeable future will place huge strains on the world's resources, especially if they are to use the 1st World as a benchmark for living standards. North America uses 3 times more food, fiber & timber than Asia & Africa.

Thus we need a new 1st World Model which can reflect new aspirations and values such as:

- Use of public transport
- Bicycles
- High rise living
- Vegetarian centric life style

- More egalitarian societies

References

World Wide Fund For Nature - Living Planet Report 2006

Published by WWF website: **http://www.panda.org/contact/index.cfm**