Paignton Zoo Environmental Park Crocodile Swamp

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LOCATION

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DESCRIPTION

Crocodile Swamp was conceived as an educational vehicle to highlight some of the world's largest reptilian predators and the threats they currently face, using three species as ambassadors for the family: Cuban crocodile (*Crocodylus rhombifer*), Nile crocodile (*Crocodylus niloticus*) and Saltwater crocodile (*Crocodylus porosus*).

The exhibit was designed to hold large crocodiles in four purpose built pools, while the fifth contains matamata turtles and the giant water lily (Victoria sp.). Landscaping in the exhibit has been designed to immerse the public into a tropical planting scheme, the aim of which is to support the visitor experience and the main animal exhibit theme of a swamp. A sub-theme for the landscaping is the conservation of plants. These are grown in close proximity to animals, so that stories can be presented in a holistic way.

Cuban crocodile. ©Paignton Zoo 2012

Cuban Crocodile Pool. ©Scott Pooley, 2011

Animals

Family	Species	Common Name	Capacity
Boidae	*Boa constrictor*	Boa Constrictor	3.3.0
Boidae	*Python molurus bivittatus*	Burmese Python	5.5.0
Boidae	*Python reticulatus*	Reticulated Python	1.1.0
Boidae	*Python sebae*	African Rock Python	1.1.0
Characidae	*Colossoma macroponum*	Pacu	0.0.10
Chelidae	*Chelus fimbriatus*	Matamata	1.2.0
Cichlidae	*Labeotropheus fuelleborni*	Blue Mbuna Cichlid	100+
Cichlidae	*Pseudotrophus zebra*	Cobalt Blue Zebra Cichlid	100+
Crocodylidae	*Crocodylus mindorensis*	Philippine Crocodile	1.1.0
Crocodylidae	*Crocodylus porosus*	Saltwater Crocodile	1.1.0
Crocodylidae	*Crocodylus rhombifer*	Cuban Crocodile	2.2.0
Crocodylidae	*Tomistoma schegelii*	False Gharial	1.0.0
Gekkonidae	*Phelsuma laticauda*	Gold Dust Day Gecko	100+

Snakes are housed in three purpose built enclosures. The first, an open air exhibit, allows visitors an unobstructed view of giant snakes: reticulated python (*Python reticulatus*), Burmese python

Size (Space allocation in square meters)

Use	Indoors		Outdoors		Total Exhibit
	Accessible	Total	Accessible	Total	
Animals		170			170
Visitors		100			100
Others		230			230
Total		500			500

Open Air Giant Snakes Exhibit. ©Scott Pooley 2011.

(*Python molurus bivittatus*) and rock python (*Python sebae*). The other two exhibits are set in themed areas with special lighting schemes and tropical thunderstorm effects. Functional off-show accommodation in an attached building was constructed in Phase 2 of development to increase the amount of exhibit space within Crocodile Swamp. This space is mainly used for long term storage and for veterinary work.

OPENING DATE
3 May 2008

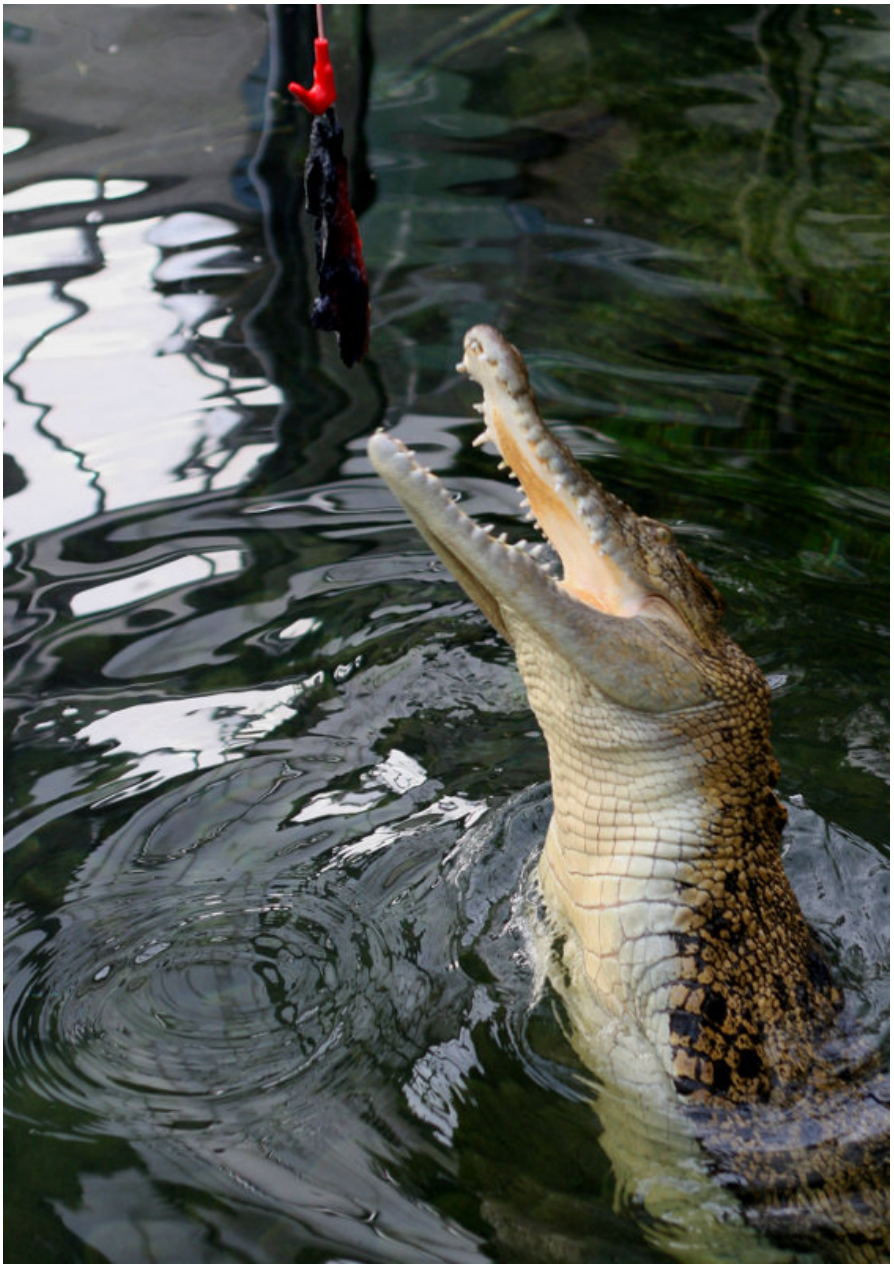
COSTS
GBP 1,300,000 including n/a % for design. A grant was given from the European Regional Development Fund (ERDF) and £800,000 .

DESIGN
Beginning: August 2006
- Architecture: Kay Elliott Architects, Torquay, Devon
- Exhibit design: Zoo staff

PLANTS
Crocodile swamp is a composition of animals and plants in one building. The building has sufficient height for full grown trees. The planting was designed to detract from the structure of the building by enclosing the visitor in vegetation. Plants were chosen for their aesthetics and of conservational importance, as well as providing an educational factor.

They were chosen from three different areas of the world, reflecting the ranges of habitats of the animals in the exhibit. Many of these locations are of conservational significance: Belize & Costa Rica (South America), Madagascar & Mauritius (Indian Ocean), and locations in the Caribbean. Some of these species will be recognised by the visitor as the fruits being found widely in supermarkets. Other species reflect amenity interests found in tropical gardens and medicinal plants such as the endangered Madagascan periwinkle (*Catharanthus roseus*) which have retarding effect on progress of leukaemia.

FEATURES DEDICATED TO ANIMALS
All exhibits have species specific thermoregulation and planting to provide behavioural and



Saltwater crocodile feeding. ©A Meek 2011.

Themed Giant Snake Exhibit . ©Scott Pooley 2011.

environmental enrichment, such as cover, the opportunity to dig and a range of other behaviours. The building is maintained at a temperature of 25°C during the day and 18°C at night.

FEATURES DEDICATED TO KEEPERS

All the pools are interconnected so that the animals can be moved around for enclosure maintenance and cleaning and to separate individuals in case of aggression. Exhibits can be emptied from water for maintenance via a pumping system.

FEATURES DEDICATED TO VISITORS

Crocodile Swamp provides viewing of crocodiles from above to underwater towards the exit. Landscaping was designed to immerse visitors into a tropical environment. Ramp structures make the exhibit accessible to disabled visitors.

INTERPRETATION

Interpretation is through a mixture of interactive exhibits and graphics. Children and adults can stand on the scales to see what size giant lily pad would hold their weight. Visitors can dare to put their hands in a crocodile's mouth to reach a ticking clock. A rain machine simulates the sound of the rain in the rainforest. A 'shop' by the exit allows you to see the environmental cost of the everyday products in your home.

These exhibits are accompanied by informative signs on the species, their conservation status, threats and ecology. Many plants grown within the exhibit are significant to conservation, commercial and everyday use.

MANAGEMENT

The enclosures and pool systems are linked through water and by land, thus allowing to shift the animals. This linkage allows keepers to separate males from females and juveniles or sub-dominant animals from higher ranking or more aggressive

Environmental Supermarket Interactive. ©Scott Pooley 2011.

individuals. Moving animals is facilitated by the crocodile target training program which is aimed at reducing aggression and stress and allowing a passive move to take place.

Exhibits can be emptied of water *via* a pump system for general maintenance when the crocodiles are moved. The 'water lily' pool can be utilized as a crocodile enclosure, if required.

Off-show crocodile facilities allow large crocodiles to be sectioned off for long term veterinary work, if required. Large snakes, lizards (including monitor lizards), etc. can also be accommodated with ease in the off-show space.

RESEARCH

Enclosure success was evaluated by:
- research on behaviour as a measure of welfare for Burmese pythons (*Python molurus bivittatus*) (talk presented at BIAZA research symposium by Charlotte Hopkins, Durham University);
- post-occupancy evaluation for crocodiles by Janneke Peters (Vanhall Institute);
- visitor reactions, attitudes and interpretation by Jaya Kumar (University of Plymouth).

Further studies are due to determine whether boundary level interactions occur and what causes interactions. Field links are being investigated for crocodile conservation through the IUCN.

CONSERVATION

The zoo holds the European Stud Book for Cuban crocodiles and has begun research into the degree of hybridization and the status of the European captive population. The plan is to link the European Stud Book to in-situ efforts in Cuba.

Maximum use of natural light and passive solar heat is gained from the exterior construction which uses thermostable materials to reduce heat loss and solid walls to absorb and retain heat. The exhibit meets 80% of its heating requirements with a wood fuel biomass boiler which was bought with a grant from the Low Carbon Buildings Programme. It uses woodchip or pellets as fuel sourced from zoo waste timber and local forestry timber. Rainwater is collected from the large roof area in order to save and recycle resources. The pools are supplied and replenished by a bore hole on the site.

The Biomass Boiler at Crocodile Swamp. ©Scott Pooley 2011.