

ZooLex feature for May

The Pygmy Hippopotamus/Mandrill Exhibit at the Royal Melbourne Zoological Gardens



Royal Melbourne Zoological Gardens
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URL: <http://www.zoo.org.au>

Keywords: Water management, soil remediation, natural behavior, immersion, Africa

ANIMALS:

Family	Species	Common Name	No.
Hippopotamidae	<i>Choeropsis liberiensis</i>	Pygmy Hippopotamus	2
Primateae	<i>Mandrillus sphinx</i>	Mandrill	5

Description:

Under the zoo's 1989 master plan, animals will be displayed in bioclimatic zones. Within each zone, species will be grouped geographically, for example, African tropical rainforest species will be displayed in the same part of the tropical rainforest zone. The Pygmy Hippopotamus/Mandrill Exhibit is sited to complement the Gorilla Rainforest Exhibit. All these exhibits are planned using the one general theme, to recreate an African tropical rainforest habitat. A riverine or stream bank setting was developed to provide an appropriate environment to display the hippos and mandrills. One objective in planning the exhibit was to follow the masterplan philosophy of designing exhibits that promote natural behaviour of the resident species. Another objective was to display animals in groups similar to natural group structures. Hippos are solitary in the wild, and thus displayed in two separate exhibit areas. While it would not be possible to show a group of mandrills as large as many natural groups (up to 250 animals), it was decided to display one breeding unit comprised of a male, several females, and their offspring.

Size:

Two Hippo exhibits occupy 600 m² each (1200 m² total). Off-exhibit space is 3 stalls (4 m² each) and two outdoor yards (46 m² each), for a total of 104 m² off-exhibit area. Mandrill exhibit is 620 m², with 400 m² accessible by animals. Space allocation in square meters:

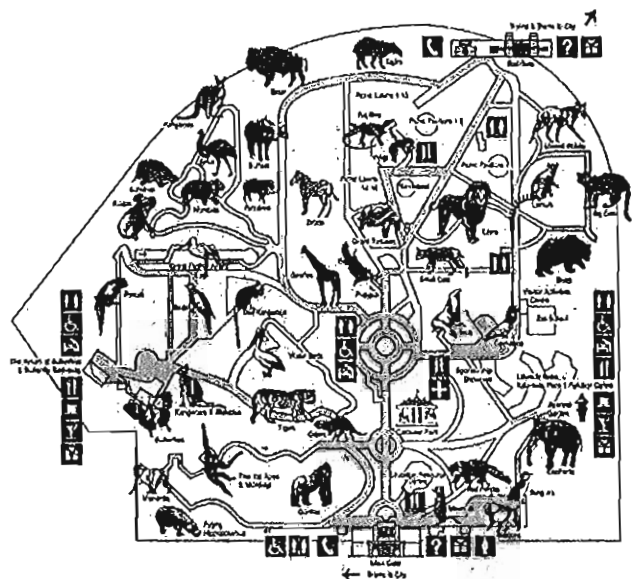
Costs:

AUS Dollars 1,776,000 including % for design.

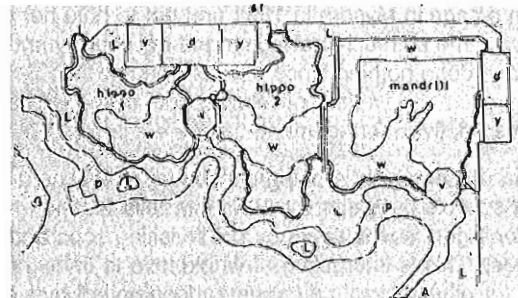
use	indoors		outdoors		total exhibit
	accessible	total	accessible	total	
animals		26	1,760	1,970	1,996
visitors	0			850	850
others					
total					2,946



Pygmy Hippo



The pygmy hippo/mandrill exhibit is situated on the left of the main entrance, at the bottom of the map. ©Melbourne Zoo, 1998



L. landscaped area; d. den; y. yard; s. service road; w. pool/moat; p. public footpath; v. visitor viewing structure; A. path to arboreal primates; G. gorilla rainforest exhibit

Opening date:
April, 1992

Design:

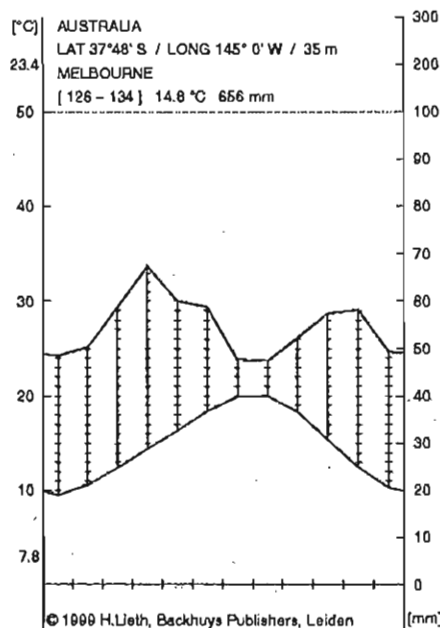
Beginning: 1989
Architecture: Grouse Fleming & Bate,
Windsor, Australia
Landscape Architecture: Sherman &
Yanez,
Engineer Consulting: D. W. Thomson
Consultants,
Engineer Consulting: John Mullen &
Partners,
Engineer Consulting (elec. & mech.):
EMF Consulting Engineers
Irrigation Design: Irr. Design Consult-
ants./ACIL Pty Ltd.

Construction:

Beginning

Local conditions:

This is a climatic diagram for the
closest weather station.



Plants:

Selecting suitable plants led to re-
search of actual African rainforest
habitats. Whilst very few West African
rainforest plants are available in
Australia, this information provided
clues to the types of plants that would
be suitable as substitutes. One could
only speculate how "Hippo proof" or
"Mandrill proof" any particular species
would be. The Gorilla Rainforest exhibit
provided a reference point for selecting
plants for the Mandrill exhibit. It was
thought that species that survived well
in the Gorilla Rainforest would also be



This exhibit is comprised of three separate enclosures: one for a large group of
mandrills, and two that each house one pygmy hippo. ©Monika Fibey, 2001



The dominant vegetation in the mandrill exhibit comprises tall, straight-trunked
trees, with a varied undergrowth of herbaceous plants. ©Monika Fibey, 2001

successful here. A number of plants
were trialed in temporary pygmy
hippopotamus yards. Those species
that were ignored by the animals
formed the basis of the planting. In all,
about 600 plants, comprising 100
species were included. The majority of
these are African species, many from
southern Africa where the climate is
similar to Melbourne's temperate
conditions. Australian rainforest plants,
and to a lesser degree, Asian rainforest
plants, have also been included. There
was concern, particularly within the
pygmy hippo exhibits, that animal
activity would create soil compaction,

making it difficult to establish and
maintain vegetation. By introducing a
sandy loam with a uniform particle size
and sub-surface drainage, compaction
problems have largely been avoided.
An elaborate irrigation system, how-
ever, is needed to ensure adequate
moisture levels.

The plant list specifies the Latin names
of the plants used for this exhibit.

Features dedicated to animals:

The outdoor off-limits areas allow
for hippos to be exhibited on a rotating
basis (alternating days). The off-limits
area for mandrills contains sand for

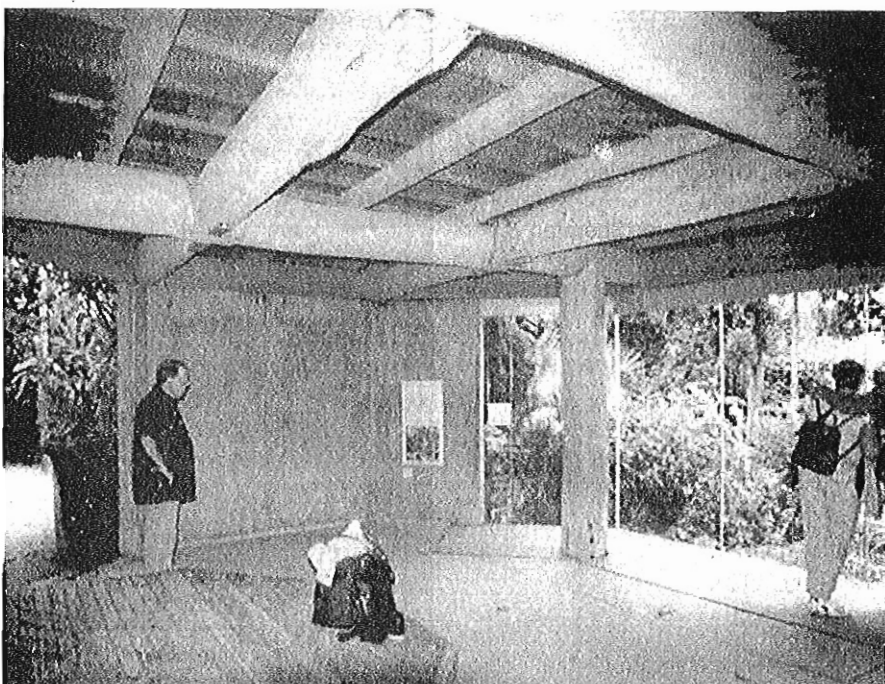
food foraging and branches for climbing. It is masked by artificial rock work, sculpted so as not to provide footholds and allow escape. Electric fencing provides an additional barrier and is also used to protect trees from foraging by mandrills. Climbing logs are a feature of the exhibit, enabling mandrills to establish pathways through the exhibit whilst reducing the likelihood of soil compaction - a little like a boardwalk for visitors to a national park! The water moat (the primary barrier, with a width of 4M and depth varying from 1.2m to 1.8m) includes a plastic netting material that hangs vertically on the inner wall of the moat. This netting material was placed to provide a hold in the event that a mandrill fell into the moat, allowing it to haul itself out. Knowing that mandrills spend the greater part of their time foraging in or near the forest floor, every effort has been made to accommodate such behaviour. Wood-chipping of the substrate provides an ideal medium for foraging, and the ground level logs attract invertebrates.

Features dedicated to keepers:

The design enables transfer of an animal into a crate without need for handling the animals. The holding structures are built from concrete blocks having filled cavities and reinforced with steel. Off-limits yards adjacent to the barn include small pools. The barns have provision for hay storage, storage of keeper needs, and a sink and bench. The structures have heating and running water. A ladder and catwalk lead over the mandrill off-exhibit enclosure providing keepers with an overview of the exhibit and an observation point.

Features dedicated to visitors:

The exhibit has two major viewing structures. Each is a covered, octagonal shaped structure which allows viewing through glass windows. The windows have a total thickness of 40mm, consisting of three 12mm layers of glass separated by two polymer membranes. One structure, providing underwater viewing, is located between the two pygmy hippopotamus exhibits. This creates the illusion that the two exhibits are joined. Visitor pathways are formed of compacted gravel and meander through a landscaped area which complements the exhibit.



Two octagonal, covered viewing pavilions complement outdoor viewing areas into the mandrill habitat. ©Monika Fibey, 2001



Over 196, 000 L of water offer ample space for hippos to display natural activities. Management of the water quality is one of the most extensive maintenance requirements of the exhibit ©Monika Fibey, 2001

Interpretation:

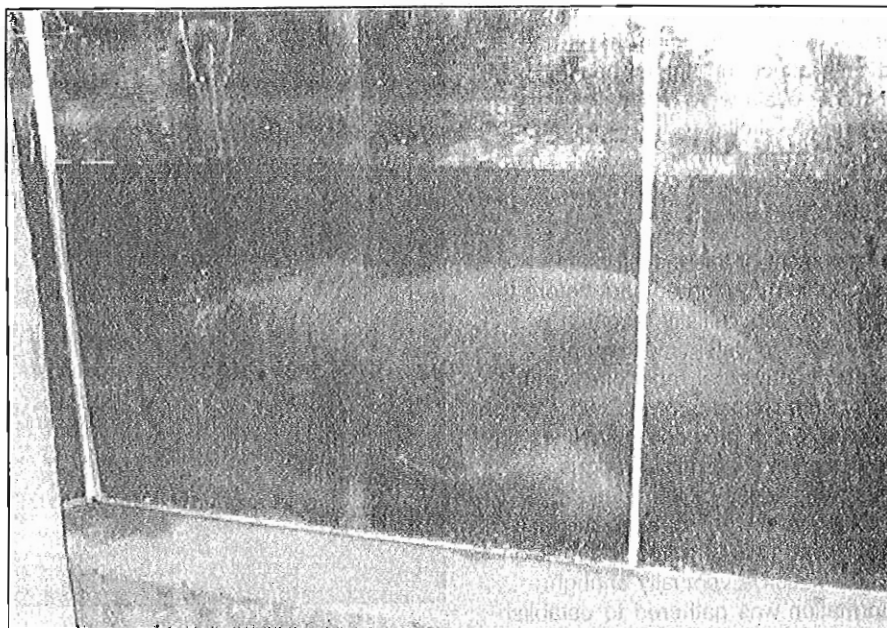
Although the major interpretive opportunity is habitat immersion (it is hoped that visitors feel as though they have arrived at a river after winding through the rainforest), signage is also used to provide additional information. Three levels of signage are used to provide information about the animals and their habitat. Animal identification signs illustrate geographic range, and detail habitat, diet, group structure and IUCN

status. Additional panels provide more detailed information. In the case of the pygmy hippopotamus, the Nile hippopotamus and pygmy hippopotamus are compared, noting their differing adaptations and relating this to their habitats. For the mandrill, their brilliant colouration is discussed. To complement the African tropical rainforest theme, other signs cover topics including diversity in the rainforest, the role of animals in dispersing seeds

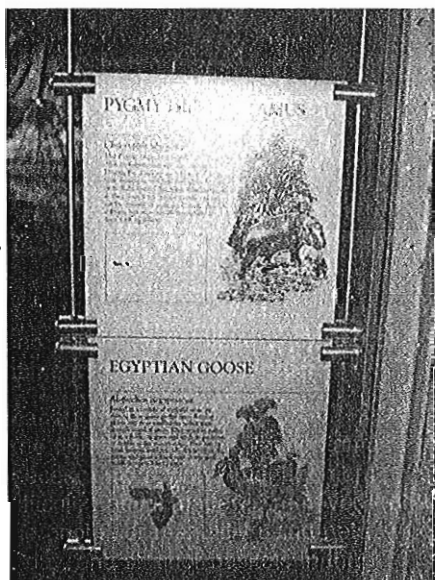
and pollinating plants, and cycling of nutrients within the rainforest.

Management:

The fibrous nature of hippopotamus faeces makes water management difficult. Faecal matter is removed from the pool floor manually using nets twice a day, and strainer baskets in the surface skimmers remove most of the debris prior to filtration. Before going on display the animals are given access to off-limits pools which encourages defecation in these areas. Instead. These pools are run independently, are not filtered and are emptied every day. Combined, the two hippo pools have a total capacity of 196,000 liters which is filtered to provide a turnover of 2.5 hours. A balance tank is fed soiled water by surface skimmers. From this tank, submersibles pump the water into high-rate sand filters whereby it re-enters the displays. Return inlets occur at several points including a row of high velocity spa-jets positioned under the viewing windows, to prevent an accumulation of waste material on the pool floor in the immediate viewing area. In addition to poly aluminium chloride, the use of chlorine was investigated during an experimental trial period. Very little information is available on chlorine treatment in

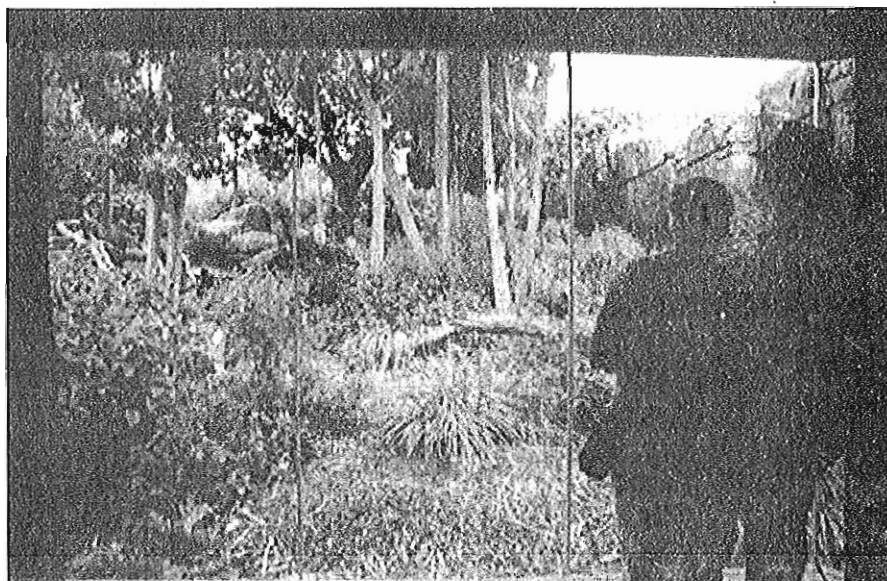


Underwater view of hippos swimming. The mandrill exhibit forms the backdrop for this view, making the two exhibits appear connected. ©Monika Fibey, 2001

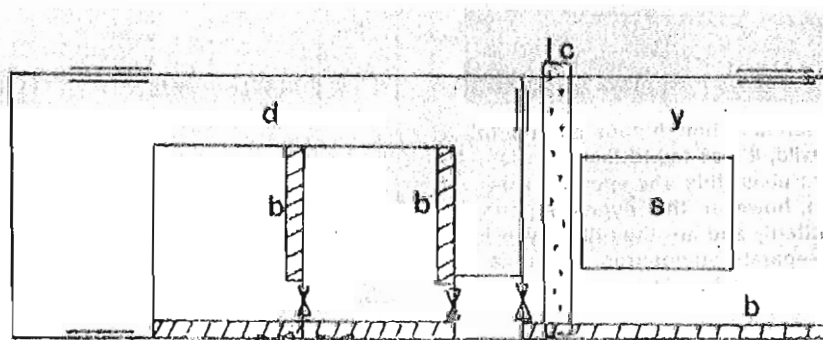


Interpretive signs discuss diversity in the rainforest, as well as the importance of seed dispersal by animals and nutrient cycling in the rainforest.

©Monika Fibey, 2001



To encourage a primary natural behaviour in mandrills - foraging for food on the forest floor - wood chips have been provided as a substrate. Also fallen logs were placed in the exhibit for the purpose of attracting invertebrates. ©Monika Fibey, 2001



Off-exhibit Facility for Mandrills. d. dens; y. yards; s. sand area; b. bench; lc. ladder and catwalk to observation point; k. keeper access; a. animal access

hippopotamus pools but preliminary results were encouraging that it had no adverse affects on animal health. Chlorine levels were maintained within parameters similar to those for marine mammals (free chlorine 0.3-0.5p.p.m. and total chlorine <1.0p.p.m.).

Research:

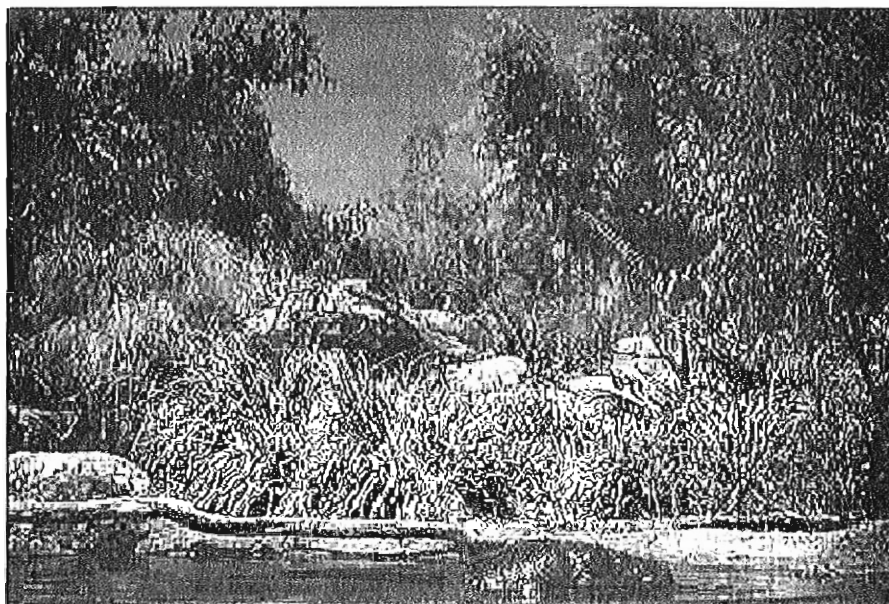
Development of this exhibit commenced in 1989, three years before the exhibit opened. Initially research was undertaken to determine natural habitat, behavioural repertoires and captive requirements of the two species, which provided guidelines for the design of the exhibit. Various possible sources of information, including field workers were contacted and proved most obliging in provision of information. Eventually enough information was gathered to establish the life history for both species. This information established two key elements for the exhibit: nature and dimension of barriers, and the type of habitat that was to be created.

Conservation:

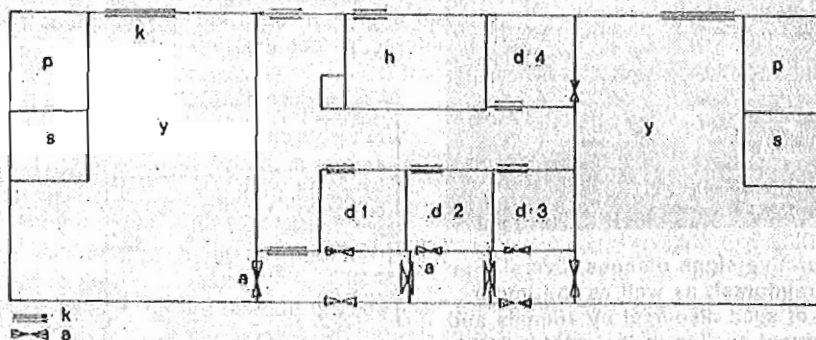
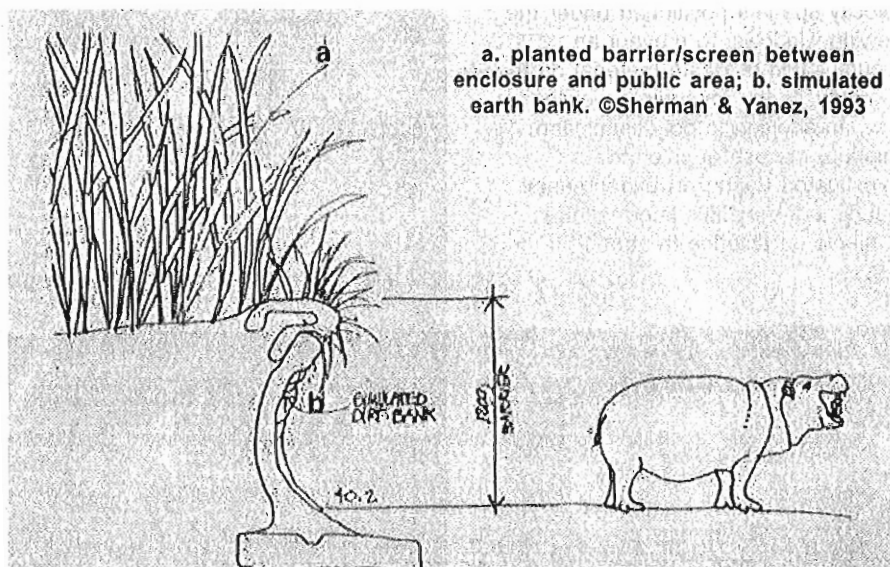
The mandrill sleeping quarters contain raised benches made from recycled plastic. Water is recycled through the exhibit.



In researching how hippos behave in the wild, it was found that little is known about this shy species. It is known, however, that pygmy hippos live solitarily and are thus displayed in two separate enclosures. ©Monika Fibey, 2001



The two hippo enclosures surround a stream with artificial rock banks. The land areas are planted with tropical grasses, sedges and wetland plants. Natural rocks placed within view of visitors add visual interest. ©Melbourne Zoo, 2002



Off-exhibit Facility for hippos. d. den; y. yard; p. pond; s. slope; h. hay storage; k. keeper access; a. animal access. ©Sherman & Yanez, 1993