# Dallas Zoo
# Giants of the Savanna - Elephants and Ungulates

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http://www.zoolex.org/zoolexcgi/view.py?id=1595

**LOCATION**
650 South R.L., Thornton Freeway (I-35E), Dallas, Texas 75203
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URL: http://www.dallaszoo.com

**KEY WORDS**
immersion, mixed species, rotation, savanna

**AWARDS**
2011 Distinguished Building Award (TEXO)

2011 Exhibit Award, Significant Achievement (AZA)

2010 Outstanding Construction Award for Specialty Construction (AGC, Texas Building Branch)

2010 Outstanding Construction "Best of Build Award" (AGC, Texas Building Branch)

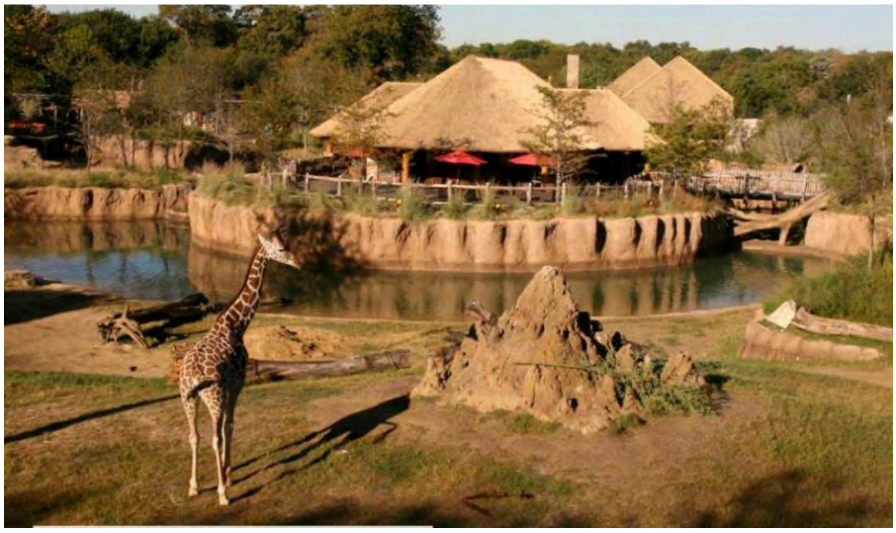
**DESCRIPTION**
Giants of the Savanna was developed to improve the health and welfare of the Dallas Zoo's African savanna species, to provide exciting safari experiences for guests, and to advance the Dallas Zoo's and the AZA's elephant management program.

Prior to the completion of the Giants of the Savanna, elephants, giraffes, and lions were housed in older facilities, some dating back to the 1930s and the Works Progress Administration.

A design/build process, led by the architects at CLR Design, enabled the Zoo to fast track design and construction and allowed the project to move from the design concept to move-in within an 18-month period.

The Dallas Zoo is the first zoological park in North America to successfully integrate African elephants with giraffe, as well as other African species. Elephants, ostrich, zebra, impalas, and both

**Elephant. ©*Dallas Zoo, 2011***



**View from observation tower to Base camp. ©*Dallas Zoo, 2011***

**ANIMALS**

| Family | Species | Common Name | Capacity |
|---|---|---|---|
| Bovidae | *Aepyceros melampis* | Impala | 8 |
| Elephantidae | *Loxodonta africana* | African elephant | 6 |
| Equidae | *Equus burchelli* | Plains zebra | 1.0.0 |
| Equidae | *Equus burchelli boehmi* | Grant's zebra | 3 |
| Giraffidae | *Giraffa camelopardalis reticulata* | Reticulated giraffe | 13 |
| Numididae | *Acryllium vulturinum* | Vulturine guinea fowl | 8 |
| Numididae | *Numida meleagris* | Helmeted guinea fowl | 10 |
| Struthionidae | *Struthio camelus* | Common ostrich | 4 |

helmeted and vulturine guinea fowl can be seen together on any given day in the large savanna habitats.

**SIZE**
45680 m², thereof 26% landscaped / non-exhibit area, 11% service area, 9% guest area.

Space allocation in square meters:

| use | indoors | | outdoors | | total exhibit |
|---|---|---|---|---|---|
| | accessible | total | accessible | total | |
| animals | | 2,416 | | 26,466 | 28,882 |
| visitors | | 180 | | 4,094 | 4,274 |
| others | | | | 12,523 | 12,523 |
| total | | 2,596 | | 43,083 | 45,679 |

**COSTS**
USD 32,000,000

**OPENING DATE**
28 May 2010

**DESIGN**
Beginning: September 2008
• Design: CLR Design, Philadelphia, PA
• Construction: Sedalco Construction, Dallas, TX
• Construction: MetalMan Design/Build Corp., Dallas, TX


**Overview: Giants of the Savanna is located in the Wilds of Africa (indicated by the red circle in the middle right of the image). ©*Dallas Zoo, 2015***

**South Habitat: View of South Habitat water feature with shaded guest viewing (image left), observation tower (back of image near termite mound), and shade structure (image right). ©*Dallas Zoo, 2011***

**CONSTRUCTION**
Beginning: May 2009

**PLANTS**
Drought-tolerant landscape materials were chosen for low-water use and resemblance to African plant species.

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

**FEATURES DEDICATED TO ANIMALS**
The mixed species exhibit is an activity-based habitat, which provides both physical and psychological space for the animals. The large grass areas with varied topography allow the multiple species to interact with one another or keep their distance as they choose. Multiple pools allow natural behavior including bathing by the elephants. Keepers provide large deadfall as enrichment when they are available.

Enrichment and positive reinforcement are key components of every keeper presentation.

The Tembo Udango habitat serves as an additional habitat for the elephants. Designed to resemble an elephant waterhole, the swimming pools allow elephants to fully submerge in 567811 liters (150000 gallons) of water. A 7.6 m (25-ft) structure,


**Flip book: Interactive flip books provide educational information at the habitats. ©*Barbara Brem, 2015***

**Gates between habitats: Large gates separate the north and south habitats and the giraffe area. This allows management to regulate when the species are mixed. ©*Barbara Brem, 2015***

designed to resemble a strangler fig tree, forms part of the exhibit barrier that separates elephants from guests. The 'fig tree' serves as an enrichment area where elephants forage in tree hollows and reach for hay feeders hanging from branches above. A water cannon allows keepers to provide additional cooling during hot Texas summers. Mud wallows and sand piles are located in both the Tembo Udango and the South Habitat.

The South Habitat is approximately 1 hectare (2.5 acres) in size, with undulating hills and mud banks, large pools for swimming, waterfalls, and termite mounds. The exhibit provides access to the off-exhibit elephant holding yards and the elephant barn. The South Habitat is adjacent to the North Habitat, separated by a hydraulic gate that can open to create one continuous range. Combined, both habitats are 259 meters (850 feet) in length. Migration corridors, which were a significant portion of the Tarangire Elephant Project, were factored in during the design of the Savanna, thus providing multiple pathways for animals to travel within the habitat. Four overhead hay net feeders are attached to the three observation towers.

The North Habitat and the Giraffe Feeding Habitat are multi-tiered areas that sit between the South Habitat and two holding barns for giraffe and hoofstock. It is a prime viewing area for giraffe, ostriches, zebras, impalas, and guineafowl.

**Tembo Udango and Fig Tree. ©*Barbara Brem, 2011***

**View towards Base Camp outdoor seating. ©*Barbara Brem, 2011***

Multiple shade structures were installed in the South Habitat and in the elephant holding yards.

The 929 square meters (10000 square foot) elephant barn can hold a large elephant herd and features a communal stall with a 1.2-meter (4-foot) deep sand floor, a training wall for protected-contact training, and a track-mounted hoist with a 15000-pound capacity for enrichment items or assistance in an emergency situation. Stall floors are rubberized and heated; eight hay nets are located overhead; and large overhead fans were installed.

Stall floors in the giraffe and hoofstock barns are rubberized and large overhead fans were installed.

**FEATURES DEDICATED TO KEEPERS**

Staff work spaces and restrooms are located throughout the off-exhibit holding barns.

Elephant keepers utilize wireless microphone technology during twice daily protected-contact presentations.

Three observation towers line the back of the North and South Habitats, which are utilized by the Zoo's

**Elephant Barn: The large indoor communal stall features multiple elements to create a safe indoor environment for both the elephants and the keepers. Sand depth is 1.2 meters (4-foot). ©*Dallas Zoo, 2016***

**Outdoor yards: Outdoor yards adjacent to the elephant holding barn provides addition space for the elephants. ©*Dallas Zoo, 2016***

Research Department and other staff for studying animal behavior and for providing special guest viewing opportunities.

**FEATURES DEDICATED TO VISITORS**
Guests are immersed in panoramic views of African wildlife species roaming through open plains, rocks, rivers, and waterholes, designed to replicate the diverse landscape of Africa. Guest walkways are designed for easy movement around the various exhibits. Interpretive stations are dispersed throughout the habitat providing close-up experiences with animals and zoo staff.

Guests can listen to twice daily keeper talks at both the elephant and predator locations or participate in activities at the Simmons Safari Base Camp.

The 180 square meter (1940 square foot) structure offers the most expansive views of the South Habitat and is the primary elephant interpretive area. Designed to resemble an African safari lodge, it is constructed with synthetic thatch-covered roofing and lodge pole pine. A large overhang and plush seats at the Base Camp allow visitors to escape the Texas sun while they relax and overlook the swimming hole.

**Observation tower: Three observation towers allow researchers to view and monitor the animals. Attachments also allow the placement of enrichment items which encourage elephant movement around the habitats. ©*Barbara Brem, 2015***

Docents and interactive displays at the Simmons Safari Base Camp provide information to the visitors. The Base Camp also is utilized for overnight programs and private events.

The Giraffe Feeding Habitat features a pavilion where guests can feed the giraffes.

An existing vegetative buffer with numerous mature trees and dense understory provides a naturalistic backdrop year-round and creates the illusion of "the wild" as just beyond.

**INTERPRETATION**
Interpreters, biofacts, live animals, and video technologies help guests learn about African wildlife. In a corner of the Base Camp, a rubber replica of an elephant's wrinkled rump protrudes from a wall and invites touch, rewarding children with various elephant noises.

**Giraffe feeding habitat: The gate into the north habitat can be seen tucked between the rockwork at the left side of the image. The deadfall barrier over the water feature allows the water and visual corridor between habitats to connect while regulating access of the various animal species. ©*Barbara Brem, 2011***

Due to the wide open spaces, graphic signs in the savanna are limited, but animal encounters / keeper talks such as Elephant Encounters are presented twice daily at both the elephant and predator locations.

**MANAGEMENT**
The entire exhibit utilizes five hydraulic gates and two hydraulic drawbridges for animal movement in the elephant, giraffe, and hoofstock areas.

To encourage elephants to utilize all areas of their habitats, keepers scatter food, browse, and hay throughout to stimulate natural foraging behavior. Treats hidden in niches and on top of a wobble tree increase exploration while elevated hay nets help to exercise neck and trunk muscles. The elephant barn has a 4-foot deep communal sand floor and radiant floor heating in every indoor stall.

Mixed species (giraffe, impala, zebra, ostrich, and guinea fowl) rotation with elephants occurs on

**Pathways leading to Base Camp and additional exhibits: Wide colored and stamped concrete pathways immerse visitors in the drought tolerant vegetation similar to what they might see in the savannas of Africa. ©*Barbara Brem, 2011***

average two times per week. This animal management strategy maximizes enrichment opportunities while providing one-of-a-kind social dynamics with elephant and giraffe, not seen in any other zoological park in North America.

**RESEARCH**

The Dallas Zoo Research Department has evaluated the effectiveness of the activity-based habitats and their impact on elephant welfare and management practices. Zoo researchers have compiled years of data from the old and new zoo elephant exhibits, with a primary focus on elephant movement patterns, space utilization, socialization, foraging, and stereotypical behaviors. The results were encouraging: • Scott, N.L., Hansen, B., LaDue, C.A. et al. (2016). Using an active Radio Frequency Identification Real-Time Location System to remotely monitor animal movement in zoos. 4: 16. doi: 10.1186/s40317-016-0108-5 (springer.com). • Scott, NL (2014). Improving the Welfare of the Dallas Zoo's African Elephants: The Evolving Giants of the Savanna Exhibit. 90th Annual Conference of the Association of Zoos and Aquariums (Orlando, FL). • Scott, NL and LaDue CA (2014). Monitoring Locomotion and Exhibit Use in Zoo-Housed African Elephants Using RFID Tags. 51st Annual Conference of the Animal Behavior Society (Princeton, NJ). • Scott NL (2012). Using RFID Technology to Monitor Elephant Movement at the Dallas Zoo. 33rd Annual Elephant Manager's Association Conference (Santa Barbara, CA). • Scott NL, Fripp D, Booth-Binczik SD (2011). Effects of Enclosure Size and Complexity on Captive African Elephant Activity Patterns. 45th Congress of the International Society for Applied Ethology (Indianapolis, IN). • Scott NL (2010). The Impact of a New Exhibit on the Activity Patterns of Female African Elephants at the Dallas Zoo. 31st Annual Elephant Manager's Association Conference (Pittsburgh, PA).

Additionally, a post-opening visitor study – "Visitor Survey Report" – was completed.
Researchers utilize three elephant activity stations to collect a variety of elephant data, such as walking distances and foraging behaviors.

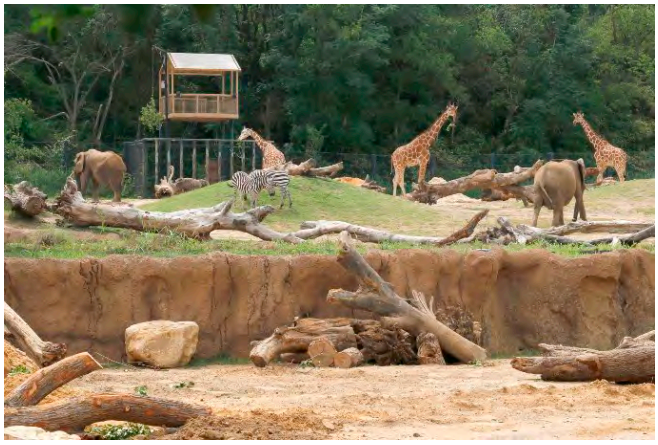
**CONSERVATION**

The Dallas Zoo participates in AZA conservation plans for six species located in the Giants of the Savanna: African elephant, lion, cheetah, plains zebra, red river hog, and reticulated giraffe.

The zoo partners with in situ projects like the Cheetah Conservation Fund in Namibia and the Tarangire Elephant Project in Tanzania. In 2010, the zoo provided more than $25000 towards field conservation projects focused on African savanna species.

The zoo also has contributed to Elephants for Africa, which studies adolescent male elephants and the viability of releasing elephants into the wild from a captive environment. In addition, children can place coins into a lion statue's mouth at the Simmons Safari Base Camp to hear a "roar" of approval.

Many sustainable design and construction practices were used in developing this exhibit. The zoo recycled metal and other materials collected from site



**Elephants and ungulates. ©*Dallas Zoo, 2016***

demolition. Large metal beams and red iron posts were reused to construct a new large mammal quarantine building. Lodge pole pines from Colorado were recycled to construct the Simmons Safari Base Camp and Serengeti Grill structures. The giraffe and hoofstock holding paddocks incorporate bamboo plywood, a renewable resource.

**LOCAL RESOURCES**

The Dallas Zoo has an agreement with the City of Dallas where they may collect browse on city property in order to provide fresh browse to the animals.