Elephant, African & Asian *Loxodonta africana & Elephas maximus*

1. Animal Type: Mammal
    a. Conservation Status:
        i. African: Threatened
        ii. Asian: Endangered
    b. Range/Habitat
        i. African: Tropical rainforest of West and Central Africa, and savanna grasslands of Eastern and Southern Africa
        ii. Asian: Dry, thorn-scrub forests of Sri Lanka and Southern Indian
2. Size: Largest land mammal in the world.
    a. African:
        i. Height at shoulder: 8.2 – 13 feet
        ii. Weight: 5000 – 14,000 lbs
    b. Asian:
        i. Height at shoulder: 6.6 – 9.8 feet
        ii. Weight: 5000 – 11,000 lbs
3. Social Structure
    a. While there is a clearly defined social structure, male and female elephants live extremely separate lives. While males (bulls) live solitarily for the most part, females (cows) travel together in a tight single-sex nomadic family group. These groups are guided by a matriarch who is usually the oldest in the group.
4. Reproduction
    a. Time of year
        i. Elephants have a brief window of ovulation which lasts only a few days per year.
        ii. A male will initiate the courtship, although the female is by no means passive during mating. The males return to their solitary lives rather quickly.
    b. Number of young
        i. Elephants typically give birth to only one calf at a time and have an average of one every four years. The gestation period for elephants is the longest of any mammal, lasting 22 months.
    c. Rearing / Mothering
        i. Similarly to humans, elephants are not born with the innate survival instincts as common to other mammals. It is imperative that they are taught survival behaviors by their mothers and other adult females in the group. This period of learning is relatively long - lasting years.
        ii. Since elephants live well beyond their child rearing years, older adults with grown offspring will often assist with rearing young belonging to others in the group.
    d. Special exhibit needs
        i. Breeding elephants traditionally is very difficult in the zoo environment for a variety of reasons including transportation of the huge mates and incompatibility. The aggression of males during mating behavior can also be a dangerous liability for a zoo, and requires separate yards dedicated to holding the bulls. Females in captivity often have an irregular or non-evident estrous cycle adding additional complication.
            1. The most consistent method for breeding elephants in captivity is by careful monitoring of hormones and artificial insemination. This method is best supported by a qualified team of biologists and scientists in an adequate support laboratory.
5. Behavior
    a. Nocturnal vs. Diurnal: Diurnal & Nocturnal
        i. Elephants do not sleep very much. They have to forage for food nearly all the time to satisfy the needs of their giant bodies
    b. Shy vs. Curious: Elephants can be extremely curious as they are quite intelligent
    c. Jumping Ability: None

d. Water Speed
    i. Estimated at 18-20 mi/hr, or about 30 km/hr
e. Land Speed
    i. Average land speed of about 5 mi/hr or 8 km/hour
f. Unique Behaviors
    i. African elephants have two fingerlike features on the end of their trunk that they can use to grab small items (Asian elephants have one)

6. Captivity
    a. Frequency in captivity: Common
    b. Noteworthy exhibits:
        i. Oklahoma City Zoo "Elephant Nation"
            1. Opened Spring 2011
            2. Size: 9acres total
                a. Barn: 15,600 sf with 8 stalls, plus community stall with sand floor
                b. Bull Yard: ½ acre with 30,000 gal pool (max. depth of 8')
                c. Flexible Yard: ½ acre with 4500 gal pool (ave. depth of 2')
                d. Cow / Calf Yard: 2.6 acre with 214,000 gal pool (max. depth of 12')
                e. Demonstration Amphitheater for 400+ guests
            3. Number of Animals: Designed for 6 plus offspring, including 2 bulls
            4. Designer: Torre Design Consortium
            5. Cost: $13 million
        ii. Dallas Zoo "Giants of the Savanna"
            1. Size: 11.4 acres total
                a. Barn: 10,000 sf
                b. Off-Exhibit Yards: 2 totaling 11,000 sf
                c. Exhibit Yards: 2 totaling 156,000 sf, shared with other hoofstock species
                d. 3 Watering Holes totaling 250,000 gal
            2. Opening date: Summer 2010
            3. Number of Animals: Designed for 6 animals
            4. Designer: CLR Design
            5. Cost: $30 million
        iii. St. Louis Zoo "River's Edge"
            1. Size: 10 acres total
                a. Barn: 13,000 sf
                b. Elephant Yards: 1.25 acres total, comprised of 3 exhibit yards and 1 off-exhibit yard
                c. Pools: 3 totaling 140,000 gal (10,000, 40,000, 90,000)
            2. Opening date: 1999
            3. Number of Animals: Designed for 10 animals
            4. Designer: Jones and Jones

7. Husbandry Regulations and Recommendations
    a. AZA
        i. Dry Rest Areas
            1. Indoor area: 400 sq ft per animal
            2. Outdoor yard: 1800 sq ft single adult individual, 900 sq ft. additional animal
        ii. Pool Size: Required in outdoor yards, but no size recommendations.
    b. Barriers
        i. 3m wet moat; Dry moats unacceptable

c. Water Temperature
    i. 60 degrees F
d. Air Temperature Range
    i. Minimum 55 deg F
e. Other:
    i. Must have access to outdoor yard with natural substrates including soil, grass, sand
    ii. Must have access to large sturdy items such as rocks or stumps for rubbing
    iii. All new exhibits must have capacity for at least 3 female elephants
    iv. Exhibits must have ability to separate herd into smaller groups, and facilities looking to hold bull elephants must create at least one yard specifically for bulls.

8. Enrichment
    a. There are four main rules for environmental enrichment for elephants:
        i. Allow opportunities for appropriate social interaction.
        ii. Provide conditions in which the elephant's exploration is rewarded with new and useful information, allowing it to make choices about its activities and some control of its environment.
        iii. Offer cognitive challenges, such as learning what a trainer is requesting, or solving a task.
        iv. Provide opportunities for elephants to seek shelter, forage, exercise, etc, in a species-appropriate way.
    b. Zoo Approved
        i. St. Louis Zoo provides sensory stimulation, indoors as well as outdoors.
            1. Interactions with visitors as well as mirrors and colored lights stimulate the elephant's sight.
            2. Apply perfume, vinegar, and spices to play items to provide new and curious smells.
            3. Nature CD's for the elephants to listen to.
            4. Flavored water, new fruits, and new vegetables are given as rewards and tasty treats.
            5. Elephants use their sensitive trucks to explore objects. Bubbles, running water, shredded paper, and rubber tires are provided.
            6. Mulch and pine shavings are provided in the exhibit to encourage dusting and playing behavior.
            7. The exhibit is long and large with varying slopes to encourage exercise and walking.
            8. Pools are provided for play and cleaning. Streams run through the habitat as well.
                a. One pool is large enough for the elephant to be completely submerged.
                b. The other pool provides a waterfall for showering.
            9. Heated overhangs are provided on the colder days. These areas also help provide a break from the wind.
            10. Food is hidden in a variety of ways.
                a. Scattered
                b. Feeder puzzles
                c. Hanging browse
            11. The animals are rotated with each other throughout the days providing different social interactions.
            12. The elephants are also provided rest days – days of no extra activities so they can have a break.
        ii. The Zurich Zoo keeps the elephants busy, to prevent boredom and abnormal behavior.
            1. Scratching trees and mud pools are necessary for hygiene but also keep the elephant active.
            2. 'Hiding' food and making the elephants search for it encourages natural foraging behaviors that occur in the wild.
            3. Hayracks are provided with narrow openings, divided by metal bars, to make it difficult for the elephants to reach their food. This way they can only pull out small amounts of hay, thus keeping them busy throughout the day.
            4. Thick and thin tree branches are provided, making the elephants break them down into bite-sized portions.

5. Toys can be provided, but safety precautions have to be taken to prevent zoo visitors from thrown objects.
    a. Large heavy solid rubber balls can be provided. The elephants like to push this in the water, fish it back out, and push it in again.
    b. Metal beer barrels, suspended and with hidden food, can keep the elephants busy as they roll it over and over to hear the noise and be surprised by the food.
    c. Toys must be replaced, repositioned, or removed for weeks so as to keep the animal's interest.
6. Elephants are taken out of their enclosure one at a time and walked through the zoo as an enriching exercise. Direct contact must be provided at all times, and elephants should only be taken out one at a time.

iii. Oregon Zoo uses toys for enrichment, while planning special events as surprises for the elephants.
1. "Boomer balls" are balls with small drilled holes. These are filled with nuts, raisins, and other food so that when they are moved around treats fall out. The elephants love to kick these balls around, although some elephants like to step on them and destroy them quickly.
2. Food is hidden on the site, hidden in holes, under logs, and other surprise places.
3. Unique scents are provided splashed occasionally in the exhibit. They even use tiger urine.
4. Elephant exercise programs are provided to keep the animals fit.
5. Oregon's main event with the elephants is the "Squishing of the Squash." Large amounts of giant squash are provided in the exhibit, allowing the elephants to trample through the squash and make a fun mess.

c. Ideas for U.S. Zoos (utilized in other parts of the world):
i. Elephants are taken on a stroll in other countries, but not provided the roaming walks here in the states. This could be attempted, or perhaps the elephant's enclosure could be near a hoof stock pasture that they could stroll through.
ii. Some zoos provide painting opportunities for the elephants. This could be tried, but on a larger scale. Events could be planned where a visitor group and the elephant can share the same paint and produce pictures at the same time. Troughs of paint can be placed in containers with separating glass on top.
iii. More opportunities can be provided where balls on strings can be sent over the exhibit wall by both the visitor and the animal, providing a 'catch' game.

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