A welfare assessment of
GIRAFFES IN ZOOS

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ZOO BASICS

Zoo A
- History:
  - Founded in 1962
  - AZA accredited for past 34 years
  - Publicly funded; non-profit
- Setting: urban
- Annual Visitor Attendance: 900,050
- Location/Climate:
  - Southeastern US
  - Temperature ranges from average of 85°F (29°C) in summer to 50°F (10°C) in winter
  - Relative humidity typically ranges from 55% to 68%
  - Hurricanes possible in summer

Zoo B
- History:
  - Founded in 1995
  - AZA accredited for past 12 years
  - Privately funded; for-profit
- Setting: rural/suburban
- Annual Visitor Attendance: 1,400,750
- Location/Climate:
  - Midwest US
  - Temperature ranges from average of 73°F (23°C) in summer to 19°F (-7°C) in winter
  - Relative humidity typically ranges from 65% to 82%
  - Mid to heavy snowfall in winter
**ANIMALS**

**Zoo A**
- 1 male, 2 females
- All giraffes are PMP* members with complete records in the studbook
- No giraffes are of breeding age
- Each giraffe is healthy
- Keepers describe giraffes as typically investigative and easy going
- Two of the hand-reared giraffes get aggressive occasionally toward keepers and other giraffes

**Zoo B**
- 2 males, 7 females, 2 juveniles
- All giraffes are PMP* members with complete records in the studbook
- Majority are breeding-age adults
- 2 geriatric females with age-related health issues
- Keepers describe giraffes as easy-going, with rare aggression only in the males

* PMP = Population Management Plan
**Zoo A**
- Exhibit contains only giraffes
- Giraffe exhibit has been open for 3.5 years
  - All giraffes arrived after exhibit opened

**Zoo B**
- Exhibit is a mixed-species exhibit containing:
  - Giraffe
  - Ostrich
  - Grey-Crowned Crane
  - Plain’s Zebra
  - Wildebeest
  - Cape Griffon Vulture
  - Slender-horned Gazelle
  - Topi
- Exhibit has been open for 11 years
**Zoo A**

- Area Size: 1.5 acres (0.6 hectares)
  - Surface substrate: manicured lawn, dirt, and limestone
  - Surface gradient: flat
- Highlights:
  - Multiple trees
  - 2 shade structures
  - Small pond
- Entire exhibit is viewable by visitors

**Zoo B**

- Area Size: 19.5 acres + 1 acre off-exhibit yard (7.9 + 0.4 hectares respectively)
  - Surface substrate: natural grasses
  - Surface gradient: gentle hills
- Highlights:
  - Vast field with forested edges
  - Small lake
  - Shaded area with many trees and fallen logs
  - Man-made termite mound and carcass feeding station
- Visitors are not able to view ~10% of the exhibit
EXHIBIT FEATURES: OUTDOOR

Zoo A
EXHIBIT FEATURES: OUTDOOR

Zoo B

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EXHIBIT FEATURES: INDOOR

Zoo A

- 65 x 30 x 23 ft (19.8 x 9.1 x 7.0 m)
- Surface Substrate: Textured concrete and rubber mats on floor, concrete walls
- Surface Gradient: Slight slope
- Lighting: Combination of fluorescent and natural sunlight
- Heating System: Radiant heat from geothermal heated floor
- Cooling System: Exhaust fans
- 3 stalls with option of separating giraffes, usually not done
- Giraffes are not viewable indoors
**EXHIBIT FEATURES: INDOOR**

**Zoo B**

- **Size**: 100 x 40 x 25 ft (30.5 x 12.2 x 7.6 m)
- **Surface Substrate**: Textured concrete rubber mats on floor, wooden and glass walls
- **Surface Gradient**: Slight slope
- **Lighting**: Combination of high pressure sodium lights and a small amount of natural sunlight
- **Heating System**: Boiler
- **Cooling System**: None
- **Layout**: 4 stalls connected by two hallways, functioning as a round-about
- **Viewing**: Public can view giraffes indoors through ground-level glass windows

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EXHIBIT FEATURES: CONTAINMENT

**Zoo A**
- Cement walls, hot-wired cables, and hot grass*

**Zoo B**
- Cement walls, steel-wire cables, and chain-link fencing

*Hot grass is a decorative form of electrical fencing*
EXHIBIT SURROUNDINGS

Zoo A
- Proximity to Predators:
  - Lion, spotted-hyena, and cheetah exhibits are all nearby
  - Can hear lions roaring during feeding events
- Proximity to Visitor Conveniences:
  - Next to new zoo restaurant that attracts large crowds of people
  - Carousel nearby tends to be popular with guests
  - Gift shop stand is found near giraffe feeding outpost

Zoo B
- Proximity to Predators:
  - Spotted hyenas are closest (1/4 mile away (0.4 km), but not visible and are usually downwind
- Proximity to Visitor Conveniences:
  - Experiences heavy visitor traffic due to proximity to zoo entrance
PUBLIC-ANIMAL INTERACTION

Zoo A
- Minimum distance between public and animals: 0 ft (0 m) at feeding outpost and 20 ft (6.1 m) at viewing platforms
- Public-animal contact:
  - Public feedings available 5x/day for 30 min each time
  - Keeper talk on Saturday and Sunday
- Some illegal feeding has been reported (i.e., bread, fruit, or browse from zoo landscaping)

Zoo B
- Minimum distance between public and animals: 0 ft (0 m) at feeding outpost and 15 ft (4.6 m) at viewing platforms
- Public-animal contact:
  - Public feedings 6 days/week, max. 100 visitors feeding per day
  - Keeper talk once a day
- No record of illegal feedings or visitor aggravation of giraffes
**Zoo A**
- Giraffes are on exhibit for 10-11 hours per day throughout the year
- All giraffes are on exhibit together

**Zoo B**
- Summer: Giraffes on exhibit ~8 h/day
- Winter: Giraffes on exhibit only when temperature is above 40°F (4°C)
- Adult males are exhibited separately from female/juvenile herd
  - The two groups are rotated daily in late afternoon
  - Males move to the large exhibit, and females/juveniles to the small off-exhibit yard or indoor holding
EXHIBIT CLEANING SCHEDULE

**Zoo A**
- Outdoor exhibit is raked daily
- Indoor holding is hosed daily and disinfected weekly

**Zoo B**
- Outdoor exhibit has irrigation system that decomposes fecal material
- Indoor holding is hosed daily and disinfected 3x/week
**Zoo A**
- 3 full-time keepers for giraffe and elephant exhibits
- Average years experience:
  - Animal keeper: 13.5
  - Keeper at current zoo: 11
  - Giraffe keeper: 9
- 3 keepers have Bachelor’s degree, 2 keepers have high school diplomas
- Participation in AZA & AAZK:
  - 2 are AAZK members
  - One presented at 2009 Annual AZA Giraffe Conference
  - Studbook keeper for the Reticulated giraffe

**Zoo B**
- 5 full-time keepers and 4 half-time keepers for African ungulate exhibit
- Average years experience:
  - Animal keeper: 22
  - Keeper at current zoo: 17
  - Giraffe keeper: 14
- 5 keepers have Bachelor’s degree, 1 keeper has Master’s degree
- Participation in AZA & AAZK:
  - All are AAZK members
  - Two presented at 2009 Annual AZA Giraffe Conference
  - Keeper exchange participants
  - Slender-horned Gazelle SSP vice-chair
  - PMP manager for Plain’s Zebra

AZA = American Zoo & Aquarium Association, AAZK = American Association of Zoo Keepers, SSP = Species Survival Plan
VETERINARY STAFF

Zoo A
- 1 full-time exotic veterinarian, 1 full-time domestic animal veterinarian, and 1 full-time veterinary technician
- Average years experience:
  - Veterinary: 28
  - Giraffe-specific veterinary: 10
- Veterinary hospital is 16 years old
- There are plans to build a new veterinary hospital in 5 years

Zoo B
- 2 full-time exotics veterinarians, 2 veterinary student interns, and 3 full-time veterinary technicians
- Average years experience:
  - Veterinary: 27
  - Giraffe-specific veterinary: 18
- Brand new veterinary hospital opened this year
- Both veterinarians conduct research related to exotic animal medicine

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**Zoo A**
- All three giraffes are healthy
- Zoo does not mandate annual check-ups, but keepers inspect and observe each giraffe every day
- Fecal analysis done 1x/year; dewormer in food routinely
- Hooves inspected weekly and trimmed as necessary (infrequent)
- New indoor facility has giraffe restraining device which giraffes are being trained to enter for future medical exams and treatment

**Zoo B**
- All giraffes healthy, with exception of two with age-related health issues
- Each giraffe receives 2 check-ups per year (w/o anesthesia) and daily observation
- Fecal analysis done 2x/year; wormed as needed
- Hooves inspected daily and trimmed as necessary (very rare)
- There are routine blood draws and serum banking on all giraffes

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Inside of Giraffe Restraining Device

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**Zoo A**
- Hay: alfalfa and timothy mix
- Grain: Mazuri herbivore pellets
- Browse components:
  - Maple
  - Sassafras
  - Pine
  - Queen Anne’s lace
- Mineral/Vitamin supplements:
  - Vitamin E
  - Selenium
  - Zinc
  - Mineral salt block with 15 trace minerals
- Treats:
  - Rye crisps
  - Herbs and spices

**Zoo B**
- Hay: alfalfa
- Grain: Mazuri herbivore pellets
- Produce: apple, sweet potato
- Browse components:
  - Honeysuckle
  - Elm
  - Ash
  - Mulberry
- Mineral/Vitamin supplements:
  - Mineral salt block with 15 trace minerals
  - Hackberry
  - Willow
  - Bamboo
**Zoo A**
- **Schedule:**
  - Grain given inside, 2x/day in hanging feed tube
  - Alfalfa given inside in plastic hay bins
  - Rye crackers for public feeding
- Browse offered every day in non-winter months (1-4 branches/giraffe)
- Vitamin supplements given daily and mineral block available 24/7
- Fresh water from Lixit® attached to wall

**Zoo B**
- **Schedule:**
  - Grain and produce given inside, 2x/day in plastic horse feeder
  - Browse and hay given inside and outside in wire hanging feeders
  - Romaine lettuce for public feeding
- Browse offered every day (1-4 branches/giraffe)
- Mineral block available 24/7
- Fresh water from automatic waterer
Zoo A
- Operant condition program is fundamental to giraffe management*
  - Curator of Operant Conditioning oversees and aids in training
- Amount of training:
  - 6 sessions/week, 20 min each
  - All giraffes are trained
  - All respond well to training
  - 2 keepers primarily train giraffes
- Training practices:
  - Target training with clicker
  - Positive reinforcement with food (browse, produce, peanuts) and verbal reward

Zoo B
- Operant condition program is in beginning stages of implementation
- Amount of training:
  - 3 sessions/week, 30 min each
  - 3 giraffes are currently being worked with
  - All respond well to training
  - 4 keepers primarily train giraffes
- Training practices:
  - Target training with clicker
  - Positive reinforcement with food (produce) and verbal reward

*Trained behaviors will be used to improve husbandry and medical practices and for demonstrations of natural behavior (i.e. drinking stance)
## Enrichment

### Zoo A

<table>
<thead>
<tr>
<th>Enrichment Item</th>
<th>Frequency Used</th>
<th>Animal Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browse, produce</td>
<td>Everyday</td>
<td>Excellent</td>
</tr>
<tr>
<td>Rubbing post</td>
<td>24/7 access</td>
<td>Very Good</td>
</tr>
<tr>
<td>Hanging log</td>
<td>24/7 access indoors</td>
<td>Excellent</td>
</tr>
<tr>
<td>Puzzle feeder tubes</td>
<td>3x/week</td>
<td>Excellent</td>
</tr>
<tr>
<td>Boomer ball</td>
<td>2x/week</td>
<td>Fair</td>
</tr>
</tbody>
</table>

### Zoo B

<table>
<thead>
<tr>
<th>Enrichment Item</th>
<th>Frequency Used</th>
<th>Animal Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browse</td>
<td>Everyday (non-winter)</td>
<td>Excellent</td>
</tr>
<tr>
<td>Rubbing post</td>
<td>24/7 access</td>
<td>Excellent</td>
</tr>
<tr>
<td>Ice blocks</td>
<td>2x/week</td>
<td>Good</td>
</tr>
<tr>
<td>Flavored salt blocks</td>
<td>2x/month</td>
<td>Good</td>
</tr>
<tr>
<td>Perfume</td>
<td>3x/week</td>
<td>Fair</td>
</tr>
</tbody>
</table>
Stereotypic Behaviors

Zoo A
- One giraffe has been observed to spend ~40-50% of the day tongue rolling
  - No temporal or spatial factors linked to presence or rate of the stereotypic behavior

Zoo B
- Two giraffes have been observed to lick the wall or wooden poles (<10% of the day)
  - Usually after food consumption
### Daily Time Budgets*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Zoo A</th>
<th>Zoo B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locomotion</td>
<td>17%</td>
<td>28%</td>
</tr>
<tr>
<td>Feeding/Ruminating</td>
<td>22%</td>
<td>41%</td>
</tr>
<tr>
<td>Inactive</td>
<td>11%</td>
<td>5%</td>
</tr>
<tr>
<td>Stereotypies</td>
<td>15%</td>
<td>2%</td>
</tr>
<tr>
<td>Interactions with keepers</td>
<td>10%</td>
<td>4%</td>
</tr>
<tr>
<td>Interactions with other animals</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>Enrichment-oriented behavior</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*An average from all giraffes at the zoo during the day.*