

# Montgomery Zoo Elephant Management Protocol (Effective Oct. 2004)

## Elephant Program Mission Statement

The Montgomery Zoo houses elephants in order to educate the public on the unique natural history of these animals and the need for their conservation as well as the conservation of their natural habitats.

The management of this elephant program will provide optimal conditions for the overall health, comfort and welfare of our captive elephants. In addition, this collection will be managed in such a way as to maximize the reproduction of these animals on site at the Montgomery Zoo. As a result, this facility will contribute to the survival of the North American captive population of African elephants and provide scientific data in the field of elephant reproductive biology.

## Standard Operating Procedure

### Daily Routine

#### MORNING

- Morning visual check
- Prepare diets for holding yard
- Turn inside stall hotwire OFF
- Check outdoor hotwire, make sure it is functional
- Check shift gates
- Shift elephants to wash area
- Wash elephants
- Shift elephants to holding yard
- Clean barn, remove feces and uneaten food & hay
- Spray floor with water
- Apply disinfectant to floor
- Clean drains
- Rinse disinfectant away
- Sweep down all standing water from floor
- Drain drinking tubes
- Clean & secure all tools & loose items in their proper place
- Dump bobcat and golf cart at dumpster
- Prepare browse in holding yard
- Provide Enrichment and exercise opportunities

#### AFTERNOON

- Prepare stalls with fresh water, diets, bedding and hay
- Secure doors, check all locks, chain service gate
- Insure that all tools are out of elephants reach
- Turn inside stall hotwire ON
- Shift elephants to wash area
- Perform trunk check for rocks, then offer reward
- Shift elephants to their specified night stalls
- Secure doors
- Collect feed tubs
- Perform final visual check
- Clean holding yard

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## CONTINUED

### Guidelines for management and handling

When working elephants two elephant keepers must be present at all times.  
Learn and maintain the proper safe working distance as indicated by the yellow line on the floor.  
Think twice before operating any shift doors, be sure you have the correct door.  
Maintain written records of aggressive elephant behavior, even if it is subtle.  
Maintain an elephant behavior profile on each elephant.  
Never compromise your safety or the safety of co-workers or the animals, this is always the number one priority

### Safety Procedures

If a situation becomes potentially or actually unsafe:

NOTIFY YOUR IMMEDIATE SUPERVISOR OR AVAILABLE SUPERVISOR  
IF INSTRUCTED TO PROCEED BY YOUR SUPERVISOR:  
INSURE THAT VISITORS IN THE IMMEDIATE AREA OF DANGER SEEK PROPER SHELTER  
SECURE AND SEPARATE ELEPHANTS  
EVALUATE FOR POTENTIAL HUMAN INJURIES  
NOTIFY ZOO 4 IF EMERGENCY MEDICAL HELP IS NEEDED, GIVE DETAILS ON THE CIRCUMSTANCES  
EVALUATE FOR POTENTIAL INJURIES TO THE ELEPHANTS AND OTHER ANIMALS INVOLVED  
CALL VET 1 IF ANIMAL MEDICAL SERVICES MAY BE NEEDED  
SURVEY BUILDING AND EQUIPMENT FOR DAMAGE

### Public Complaints Policy

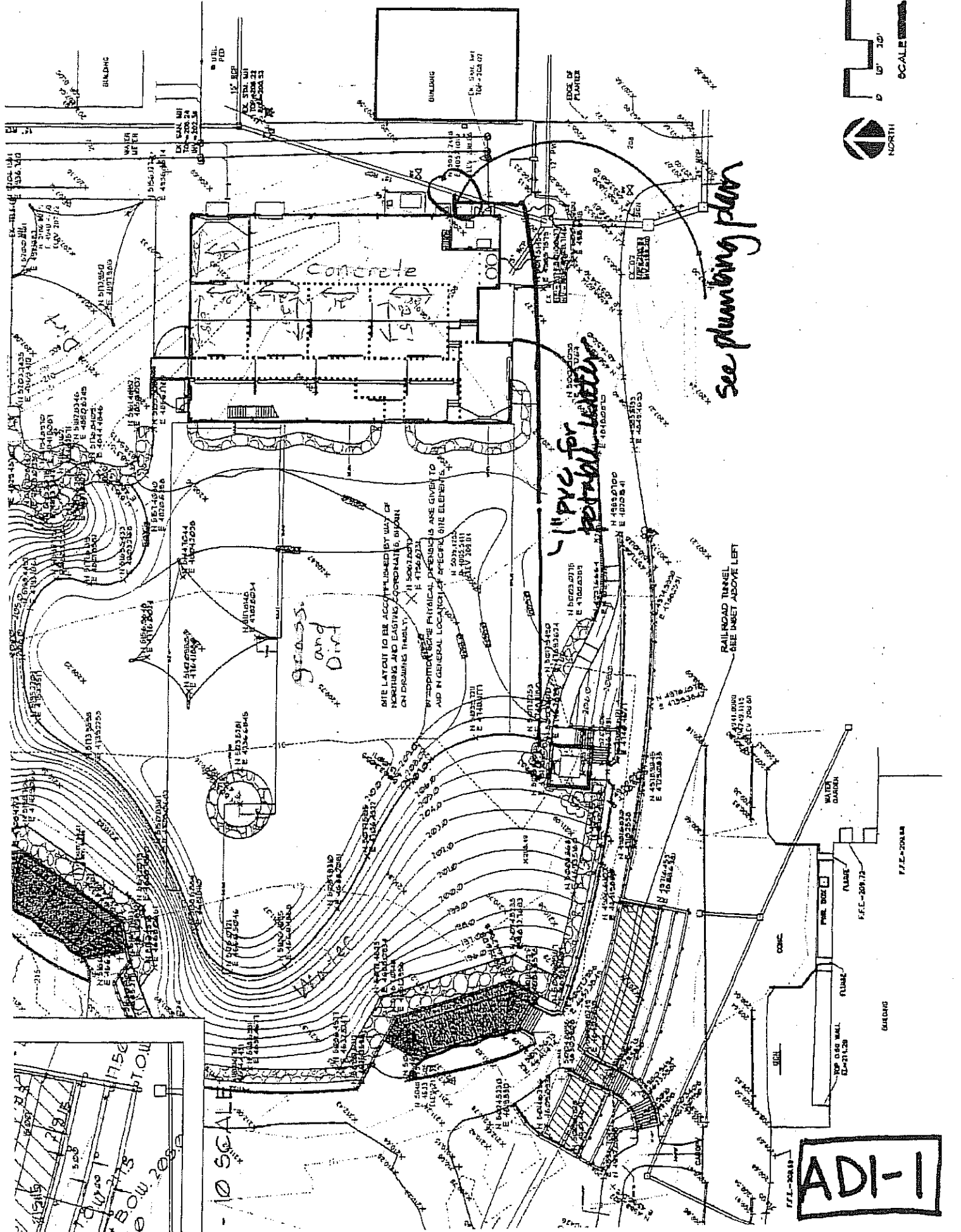
Listen  
Communicate official zoo statement politely  
Refer to proper manager

### Enrichment

Target Training Procedures  
Types of Enrichment  
Exercise program

### Building Maintenance

Purge water hoses after use  
Daily check of stall floor temperatures  
Daily check of building heating and/or cooling systems



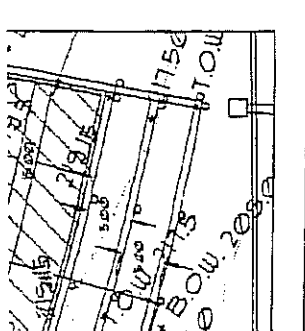
see plumbing plan

1" PVC for  
potable water

grass  
and  
dirt

THIS LAYOUT TO BE ACCEPTED ONLY BY WAY OF  
NOTATIONS AND EXISTING CONDITIONS SHOWN  
ON DRAWINGS THEREIN.

IN ADDITION TO THE PHYSICAL DIMENSIONS ARE GIVEN TO  
AND IN GENERAL LOCATIONS OF SPECIAL ONE ELEMENTS.



ADI-1



## Elephant Barn Narrative

THE  
MONTGOMERY  
ZOO

P.O. Box 3313  
Montgomery,  
Alabama 36109-0313  
Phone: 334-240-4900  
Fax: 334-240-4916  
[www.montgomeryzoo.com](http://www.montgomeryzoo.com)

A Department of  
The City of Montgomery.

*Bobby Bright*  
*Mayor*  
*Doug Givole*  
 *zoo Director*

The elephant barn at the Montgomery Zoo consists of five stalls used for night time housing. Four stalls are 21' X 25' and one stall is 28'X25'. The barn is heated and cooled year round as needed in order to maintain temperatures at 75 to 85 degrees Fahrenheit.



Accredited by the American Zoo  
and Aquarium Association

Elephant Diet  
(This diet is per elephant)

A.M.

- 6-scoop sweet feed *omlene*
- 6-scoop elephant supplement
- 6-apple
- 6-orange
- 6-banana
- 6-sweet potato
- 6-irsh potato
- 6-carrot
- 4-heads kale

P.M.

- 6-scoop sweet feed *2-5 lb*
- 6-scoop elephant supplement *2-5 lb*
- 6-apple *150gr. each*
- 6- orange *"*
- 6-banana *"*
- 6-sweet potato *200gr. each*
- 6-irsh potato *200gr. each*
- 6-carrot *80gr. each*
- 4-heads kale *300gr. each*

Hay *Bermudagrass*  
*90 kg or 188 lb*  
*per day total for*  
*on*

## *Elephants*

*Routine examinations:* Annually visual exam (protected contact), quarterly foot inspections.

Herd health evaluations: Review individual medical histories and perform visual examinations. Review herd histories for nutrition, reproduction, and species morbidities and mortalities. Develop action plan to address problems identified in herd.

Operant conditioning per SSP guidelines: All elephants **must be trained** to permit a complete body daily exam (include feet, eyes, ears, open mouth and tongue, teeth, and tusks) for any sign of abnormalities. All elephants **must be trained** to accept regular collection of blood, urine, feces, saliva, semen, skin biopsy, and temporal gland secretion.

### ANNUAL EXAMS

#### Procedures (dependent upon animal's temperament)

1. Review medical record and research requests
2. Obtain weight (at least twice yearly)
3. Ophthalmic exam
4. Visual exam and BCS
5. Dental exam
6. Reproductive examination
  - a. Consider transabdominal / transrectal ultrasound, semen collection in conditioned animals
7. Examine / evaluate all feet quarterly
8. Review keeper foot care records and frequency of foot care
9. Verify transponder (if one elephant has one)
10. Review any plasma bank requirements and collect if required (healthy animals only)

#### Diagnostics - Blood

1. CBC, serum Serum protein electrophoresis, and serum chemistry profile (quarterly in conditioned in animals)
2. Annual serum mineral levels
3. Quarterly serum Vitamin E levels
4. Annual to biannual serum Vitamin A levels
5. Serologic test (ELISA) for tuberculosis per USDA guidelines
6. Consider serologic test (ELISA) for elephant herpesvirus
7. Annual West Nile Virus serology
8. Weekly to biweekly progesterone in conditioned breeding females animals - see recommendations below
9. Any additional plasma or serum may be stored (quarterly in conditioned animals)

### **Diagnostics - Feces**

1. Feces for ova and parasite screen
2. Feces for enteric pathogen screen (3 samples submitted over one week)

### **Diagnostics - Urine**

1. Urinalysis - free catch samples

### **Diagnostics - Imaging**

2. Radiographs – feet
  - a. Consider annual to biannual depending on history/ongoing foot problems of individual
  - b. May need to do more frequently depending on individual
3. Consider thermography - feet if possible
4. Digital photographs of feet and any body lesions / abnormalities
5. Consider ultrasound - transabdominal / transrectal

### **Diagnostics - Other**

1. Trunk washes - scheduled annually outside of the routine exam
  - a. 3 within a 1 week period for Mycobacterium culture (Per USDA guidelines)
2. Research samples if requested
3. Morphometric measurements if requested

### **Potential prophylactic treatments for clinician consideration**

1. Anthelmintics
  - a. As routine fecal examinations dictate
2. Vaccination
  - a. Tetanus toxoid (equine product) 1 ml IM annually
  - b. Rabies 2 ml IM every 2 years

### **Additional procedures:**

- Parasite control based on Montgomery Zoo's parasite control plan
- Blood collection quarterly in conditioned animals to maintain behavior

### **QUARANTINE PROCEDURES (new acquisitions):**

1. Confined / Quarantined for a minimum of 30 days. Longer for imports.
2. Same procedures as for routine exam
  - a. verification / placement of transponder if possible.
3. Same diagnostics as for routine exam:
  - a. Diagnostics - Blood
    - i. CBC, serum protein electrophoresis, and serum chemistry profile (quarterly in conditioned in animals)
    - ii. serum mineral levels
    - iii. serum Vitamin E levels
    - iv. serum Vitamin A levels

- v. Serologic test (ELISA) for tuberculosis per USDA guidelines
  - vi. Consider serologic test (ELISA) for elephant herpesvirus
  - vii. West Nile Virus serology
- b. Diagnostics - Feces
- i. Feces for ova and parasite screen: 3 negative fecals for ova and parasites
  - ii. Feces for enteric pathogen screen (3 samples submitted over one week)
- c. Diagnostics - Urine
- i. Urinalysis

**Neonatal / pediatric care :**

\*\*\*\*\*See elephant birthing protocol for specific guidelines

1. Tetanus toxoid 1 ml given twice 30 days apart
  - a. Booster annually
2. Rabies vaccine when >4 months old
  - a. booster at one year and every 2 years thereafter
3. ■ Visual exam
4. ■ Physical exam and blood collection when possible

## *SSP Guidelines for Comprehensive Elephant Health Monitoring Program (March 2005)*

Routine health monitoring should be performed on all elephants on an ongoing basis. Animals should be trained to permit sampling and examination. The following protocol advises that specific baseline laboratory tests be performed for the purpose of evaluating current health status. Additional tests are recommended to increase baseline information on other diseases to determine their significance to elephant health. The final decision for specific procedures should be made by the institutional animal care and veterinary staff based on individual circumstances. For additional information, refer to the Elephant Husbandry Manual, AZA Standards for Elephant Management and Care, and the AAZV Preventive Medicine Recommendations. Additionally, it is recommended that the veterinarian review the behavioral profile of the individual animals with elephant management staff on a regular basis.

### **Minimum Database:**

1. Signalment - age, sex, origin, studbook#, ISIS#; picture of individual (as viewed from the front and sides) should be included in the permanent record.
2. Anamnesis - summary of information regarding health screens, medical problems, diagnostic test results, and treatment over the previous year (complete "Individual Annual Elephant Medical Survey" form and send to SSP Veterinary Advisor - will be available in 2006).
3. Complete physical exam by a veterinarian familiar with elephant health problems. This should include a review of all systems.
4. Body weight - actual body weights should be recorded at least annually.
5. Blood collection
  - a. Complete blood count (CBC), serum chemistry panel, fibrinogen, serum Serum protein electrophoresis, evaluated at least annually
  - b. Serologic (ELISA) test for elephant herpesvirus - contact Erin Latimer to submit samples, or Dr. Laura Richman.
  - c. Bank a minimum of 10-20 ml serum for your institution and collect a duplicate sample for the SSP serum bank. All banked samples should be labeled with species, studbook #, age, sex, and date collected. Use submission form for serum samples sent to the SSP serum bank (maintained at Disney's Animal Kingdom). Samples should be taken at least annually; ideally during the time trunk wash samples are collected.
  - d. Serum progesterone analysis in females - Serial samples should be collected weekly on an ongoing basis to evaluate estrous cycles (2). Assays can be performed at the National Zoo's Conservation & Research Center or Southwest Missouri State University. Contact specific institutions (Dr. Janine Brown - CRC (National Zoo), Dr. Dennis Schmitt - S.M.S.U.) for submission instructions (see protocol below). Other labs are available to run progesterone assays - please contact SSP advisors for current list. For those institutions considering breeding cows, LH assays should also be included to predict specific breeding dates. These can be run at the same labs.

## 6. Fecal analyses

- a. Parasite screen - Fecal samples should be collected at least semiannually; direct, flotation, and sedimentation should be performed on every sample to detect intestinal parasitism.
- b. Enteric pathogen screen - Aerobic culture of feces for enteric pathogens should include special media for the detection of *Salmonella* spp. Because *Salmonella* organisms may be shed intermittently, at least 3-5 fecal cultures should be performed (may be done on consecutive days) on an annual basis.

## 7. TB culture - refer to the current USDA Guidelines for the Control of Tuberculosis in Elephants. Protocol can be accessed on the USDA website:

[www.aphis.usda.gov/ac/ElephTBGuidelines2003.html](http://www.aphis.usda.gov/ac/ElephTBGuidelines2003.html) . At this time, annual trunk wash cultures are the only required test; however, collection of other samples for research is strongly encouraged (2 ml serum collected at the time of trunk washes should be sent to Dr. Michele Miller for use in validating other serologic tests for TB diagnosis).

- a. Samples for cultures must be collected under the direct supervision of a licensed veterinarian.
- b. Three trunk wash samples should be collected on separate days, ideally within a 7 day period. Trunk swabs are no longer acceptable.
- c. All samples should be frozen immediately after collection and shipped frozen.
- d. Ship by overnight express to NVSL (or other laboratory facility offering comparable procedures). Request mycobacterial culture with speciation (use VS Form 10-4 submission form for NVSL). **Verify that overnight carrier does not irradiate packages.**

## 8. Vaccinations

- a. Tetanus toxoid: Annual vaccination with a commercial equine product is recommended. Follow label instructions for product use (usually 1 ml IM). Data are insufficient at this time to determine adequate protective vaccine doses and titers.
- b. Rabies vaccine: Vaccination with a commercial killed rabies product approved for horses should be considered if the animal resides or will be traveling to an endemic area. Follow label instructions for product use (usually 2 ml IM). Vaccination with Imrab 3 (Merial) has induced detectable titers to rabies virus in African elephants (per M. Miller). Biannual vaccination is recommended.<sup>1</sup> Data are insufficient at this time to determine adequate protective vaccine doses and titers. Both tetanus and rabies have been reported to occur in elephants.

### **Additional Preventive Health Recommendations:**

1. Serological screening for EMC (encephalomyocarditis virus), leptospirosis (multiple serovars), and WNV (West Nile Virus). Although these tests are not species-specific and have not been validated for elephants, they may detect cross-reactive antibodies in exposed animals. The presence of antibodies does not necessarily denote infection/disease. Encephalomyocarditis virus may cause clinical disease and death in elephants. Antibodies to leptospirosis have been detected in both Asian and African elephants. At the time of this writing, EMC serologic testing was not available. Insufficient data is available at this time to determine the significance of WNV antibodies

in elephants; it is important to include the history of exposure and vaccination to WNV when interpreting results.

2. Serum vitamin E levels - submit heparinized plasma to Michigan State University (can be submitted through Antech).
3. Reproductive tract examination - whenever feasible, a complete reproductive examination should be conducted which includes transrectal ultrasound, semen collection and analysis, serum collection (weekly best, or bi-weekly to monthly) for testosterone analysis, cytology and microbial cultures of the lower urogenital tract (to be screened for bacteria, Chlamydia, protozoa, and Herpesvirus). Herpesvirus has been identified in biopsies of vaginal lymphoid patches in an African elephant. A high prevalence of uterine leiomyomas has been observed in captive Asian elephants and could be detected via transrectal ultrasound. Since both of these conditions have potentially significant effects on reproduction, a careful evaluation is warranted if the animal is being considered for breeding. All elephants (male and female) over the age of 5 years should have both ultrasound and hormonal (testosterone in males; progestins/LH in females) assessments performed.
4. Urinalysis - fluid and sediment evaluation of clean voided sample; +/- microbial culture.
5. Foot radiographs - baseline radiographs of all feet are strongly recommended. It may be appropriate to annually monitor selected elephants (i.e., those that have a history of chronic foot problems).
6. Ancillary diagnostic tests for tuberculosis - ELISA, etc. recommended for data gathering; see Guidelines for the Control of Tuberculosis in Elephants for current recommendations.
7. Other vaccination regimens will depend on regional requirements and exposure risks (consider vaccination for Clostridial diseases, Leptospirosis in areas of significant exposure/risk of exposure). Insufficient information is available at this time to provide a recommendation for West Nile Virus vaccination of elephants. Contact the SSP veterinary advisor for current information.