AZA Standards for Elephant Management and Care

Approved March 2011

The Standards below are written to focus on a results-based assessment. They will serve as a guide for institutions to measure their success in managing and caring for their elephants and for AZA accreditation inspectors to measure the success of the programs. Thus, in addition to each Standard, there is a Measurement and an Explanation to assist with understanding and meeting each Standard.

These Standards, Measurements and Explanations are based primarily on the compilation of the Elephant Husbandry Resource Guide (Olson et al., 2004) and the information presented in the AZA Principles of Elephant Management (PEM) course. These two resources contain extensive information on all aspects of elephant care and management.

The ultimate goal of these Standards is excellent elephant management and care which will result in excellent overall elephant well-being in our institutions. Ultimately, success in our elephant management and care will allow AZA institutions to contribute to elephant conservation and ensure that elephants are in our future for generations to come.

1. Abiotic Environmental Variables (address both exhibit and off-exhibit holding)

1.1 Temperature

Standard – Outdoor – Daytime: All elephants must have access to shade when they are exposed to direct sunlight. Water suitable for drinking or bathing must be available daily or at greater frequency as needed to meet the elephant's cooling needs in the ambient environment.

Water, mud, dust, soil or sand must be available for elephants to dust themselves to assist with thermoregulation. Sufficient sheltered areas must be provided to protect elephants from adverse weather. When sunlight is likely to cause overheating or discomfort of elephants, sufficient shade by natural or artificial means shall be provided to allow all elephants kept outdoors to protect themselves from direct sunlight. Shade areas must be provided to assure that all individuals can have access to shade when desired and that subordinate elephants are not excluded from the shade. Elephants exposed to temperatures below 40°F (5°C) for longer than 60 minutes, must be monitored hourly to assess the potential for hypothermia. If needed to prevent hypothermia, supplemental heat, an area of direct sunlight protected from wind/precipitation, access to indoor barn stalls or other options for thermal management must be provided for the elephants.

Standard – Outdoor – Nighttime: Elephants kept outdoors when temperatures are under 40°F (5°C) overnight, must be provided with supplementary heat and adequate shelter from adverse weather.

Measurement: No instances of frostbite, heatstroke, sunburn, illnesses or elephant deaths related to environmental temperature/weather exposure.

Explanation: Institutions should consider designing exhibits that allow elephants outdoor access as much as possible – weather, health, and safety permitting. Elephants kept outdoors can tolerate moderate temperature extremes if they have been acclimatized to the ambient conditions. Multiple sheltered areas must be provided to ensure that all elephants have sufficient access to shelter and protection from the elements. Facilities may install outdoor heat sources to extend the amount of time the elephants are able to remain outside. Radiant or forced air heating are examples of acceptable heat. There may be a need to provide supplemental heat for young or compromised elephants at temperatures above 40°F (5°C).

Standard – Indoor: Indoor holding areas must be able to be heated to a minimum temperature of at least 55°F (13°C) at all times of the year. One room must be capable of maintaining a temperature of at least 70°F (21°C) and be free of drafts for accommodating sick or debilitated elephants.

Measurement: No instances of frostbite, illnesses or elephant deaths related to environmental temperature/weather exposure.

Explanation: Care should be taken to control excessive heat indoors. At elevated indoor temperatures, the use of fans, cross-ventilation, access to water, cool substrate, allowing elephants access to an outside area or other cooling measures must be employed as needed. The key is to provide elephants with the opportunity to thermoregulate themselves as much as possible.

1.2 Humidity and Ventilation

Standard: There are no standards for humidity or ventilation at this time.

Explanation: There are no standards for humidity or ventilation at this time.

1.3 Illumination - Light intensity, spectral, and duration requirements

Standard: Ample lighting must be provided for staff to work safely around the elephants day or night.

Measurement: When staff are working around or interacting with the elephants, the elephants should be able to be clearly seen and their movements/behavior observed at all times within their indoor enclosures. Adequate light must be provided to monitor the safe use of all equipment (ERD) and the movement of all doors and gates.

Explanation: Natural daylight cycles are adequate for elephants, even in temperate regions. When kept indoors for extended periods, fluorescent, or incandescent lights provide a sufficient spectrum of illumination. Skylights, in addition to interior lighting, are effective and recommended.

1.4 Facilities

1.4.1. Space requirements, behavioral repertoire, and complexity

1.4.1.1. Indoor space

Standard: Indoor facilities must provide adequate room for elephants to move about and lie down without restriction. Appropriate space should be available to allow elephants to be separated either through individual stalling or through the use of restraints (See 3.3.2.7). Indoor housing for both males and females must be designed to accommodate an elephant that can reach up to 24 ft (7.3 m) vertically. All ceilings, wire, pipes, etc. must be out of reach or adequately protected.

Measurement: If there are elephant behavioral, social, or medical issues shown to be caused by insufficient space, there must be a program in place (from a programmatic and/or facility perspective) to address the issue.

Explanation: For facilities in climates that require elephants to be indoors for significant amounts of time, it is highly recommended that larger interior common spaces be developed to enhance social interactions and allow for greater movement and diversity of space during inclement weather conditions as well as overnight. Minimum recommended stall space (i.e. temporary holding, overnight, etc) is not less than 600 sq ft (56 sq m) for males or females with calves, and not less than 400 sq ft (37 sq m) for females.

1.4.1.2. Outdoor space

Standard: Outdoor habitats must provide sufficient space and environmental complexity to both allow for and stimulate natural behavioral activities and social interactions resulting in healthy and well-adapted elephants.

Measurement: If there are elephant behavioral, social, or medical issues shown to be caused by insufficient space, there must be a program in place (from a programmatic and/or facility perspective) to address the issue.

Explanation: Space is one of the most difficult measures to standardize. There is no scientific data which clearly indicates the amount of space needed for an elephant to be healthy and well adjusted. It is the quality of the overall programmatic approach to good elephant management and the quality of the space from an elephant perspective that determines adequacy of the facility, not simply the square footage of the environment. Thus, if the elephants are healthy and socially adapted, then whatever is being provided meets the standard. It is inaccurate to say that because a facility has a certain amount of

space, then it has good elephant management. Recommended minimum size for outdoor habitats is not less than 5400 sq ft (500 sq m) per elephant using the habitat.

1.4.1.3. Behaviors

Standard: The facility and program provides a complex physical and social environment which stimulates natural behaviors, social interactions and activity levels resulting in healthy, well-adapted elephants.

Measurement: The elephants are physically healthy and socially well-adapted without aberrant behavior or excessive aggression within the social group.

Explanation: There is no current data to indicate what amount of activity, or what daily walking distance is most appropriate for optimal elephant welfare. The basic needs may be different for each elephant. Since the goal is healthy, socially well-adapted elephants, how it is achieved is less important than that it is achieved.

1.4.1.4 New exhibits and renovations

Standard: All institutions planning new construction for elephants or modifying existing elephant facilities must include holding space for adult males in their construction/renovation plans. All new construction and major renovations must be designed in a manner that minimizes the regular need for tethering.

Measurement: Review the facilities submitted commitment to be either a holding, holding/breeding or breeding facility and review their plans to ensure compliance with the AZA Elephant Vision and Commitment statements.

Explanation: AZA's commitment to elephants will only be successful if all facilities live up to their commitment in the ability to hold males and comply with TAG breeding recommendations.

1.4.2. Minimum inter-individual distances that will influence size of space

Standard: There are no standards for minimum inter-individual distances that will influence size of space at this time.

Explanation: See 2.2.2.2. Facility must have sufficient structures for all elephants to participate in all ranges of natural behaviors. Elephants are a social species and herds often perform activities together, such as feeding, drinking, walking, resting, and wallowing.

1.4.3. Furnishings to accommodate an array of locomotive and foraging behaviors as well as resting and sleeping

Standard: See 1.4.1

Measurement: See 1.4.1

Explanation: A key consideration in the design of elephant habitats is the promotion of species-appropriate behaviors. Enrichment opportunities should be integral parts of both indoor and outdoor enclosures. Outdoor areas should encourage locomotion for exercise and natural footwear. Rocks, tree stumps, or large sturdy objects must be provided in the exhibit so that the elephants may use them for rubbing and scratching. The use of both wet and dry wallows is encouraged to assist with skin care and protection against the sun and biting insects. The Elephant Husbandry Resource Guide has extensive information on facility design and enrichment activities.

1.4.4. Visual, acoustic, and olfactory barriers within the space

Standard: The design of indoor and outdoor enclosures must contain areas where elephants can exercise and socialize together, and avoid socializing if/when desired.

Measurement: Determine the level of choice the elephants have to join or separate themselves from other elephants.

Explanation: Barriers within and between exhibits should allow some degree of auditory, olfactory, and tactile contact between separated herd members as appropriate at their choice.

1.4.5. Substrates and nesting/bedding materials

1.4.5.1. Outdoor

Standard: Outdoor habitat surfaces must consist primarily of natural substrates (e.g., soil, sand, grass) that provide good drainage. Enclosures must be made up of a combination of hard substrates and soft substrates.

Measurement: Elephant feet are in good condition and need only periodic pad and nail trimming. Excessive buildup of dead skin is not apparent and dusting materials are available for the elephants.

Explanation: Providing a variety of soft substrates will promote behaviors, such as foraging, wallowing, bathing, digging, and resting. The use of both wet and dry wallows is encouraged to assist with skin care and protection against the sun and biting insects. Elephants can lie on mounds of earth. Providing a combination of hard substrates to promote normal wear of footpads and soft substrates, such as earth and sand, to promote dust bathing is preferred.

1.4.5.2 Indoor

Standard: Substrate must be able to be cleaned daily and must be quick to dry. Hard floor surfaces must be relatively smooth to prevent excessive pad wear, but not so smooth that they become slippery when wet.

Measurement: Interior floors are cleaned daily and dry within two hours of cleaning. No excessive pad wear due to floor roughness and no elephant injuries due to slipping on the floors.

Explanation: Many institutions are experimenting with the use of sand in place of some cement stall floor surfaces. Some institutions use barn stall mats, straw, or shavings for insulation and/or to provide a softer surface for elephants to stand or lie on. In new construction and renovations, consideration should be made for incorporation of natural, changeable substrates indoors.

1.4.6. Provision of change and variation in the environment

Standard: All holding institutions must have a written environmental enrichment plan for their elephants and show evidence of implementation (See 4.3). An effective enrichment program includes the rotation of exhibit furniture and enrichment initiatives on a regular schedule, and based on the elephants' behavior, maximizes the stimulation offered by these exhibit features (See 1.4.5.1).

Measurement: Enrichment plan and records of daily enrichment activities should be reviewed (See 1.4.5.1 and 4.3).

Explanation: A varied terrain provides more complexity in the environment as well as exercise opportunities, such as walking, turning, reaching, stretching, climbing, bending, digging, pushing, pulling, and lifting. Providing a variety of soft substrates will promote behaviors such as foraging, wallowing, bathing, digging, and resting.

1.4.7. Cleaning related to issues like scent-marking, that may influence how and how often space is cleaned.

Standard: There are currently no scent-marking issues identified for elephants that influence cleaning.

Explanation: Enclosures, both indoor and outdoor, must be cleaned of excrement daily. Frequent daily manure removal is recommended and may be necessary for both sanitary and aesthetic reasons.

1.4.8. Air or water changes/hour required

Standard: See 1.2 and 1.5.2

Measurement: See 1.2 and 1.5.2

Explanation: Indoor ventilation systems for elephants should provide enough fresh air to meet the respiration needs of the elephants, control moisture build-up within the structure, and move enough air to dilute airborne disease organisms. The recommended ventilation for indoor housing for elephants is 4-6 air changes per hour.

1.4.9. Identify necessary measures for safety and containment

1.4.9.1 Fences and barriers

Standard: Elephant containment barriers must be sufficient to prevent elephant escapes.

Measurement: There should be no failure of barriers.

Explanation: A recommended minimum height of walls, cables and horizontal railings for adult elephants is 8 ft (2.4 m). The use of electric fences is not sufficient as a primary containment barrier. A wide variety of building materials can be used for elephant containment barriers. The barriers must be safe for the elephants, must be able to withstand an elephant's strength, must contain the elephant in a specific space, and must prohibit direct contact between elephants and the visitors. Recommended materials for barriers include solid concrete, rock walls or horizontal steel rails, pipe or cable.

1.4.9.2 Dry Moats

Standard: The use of dry moats with steep sides and hard bottoms as primary containment should be limited.

Measurement: A written elephant extraction protocol must be in place for facilities employing moats out of which an elephant cannot easily climb.

Explanation: Dry moats can pose a substantial threat to elephants, especially those out of which an elephant cannot easily climb. Where present, moats or "ha-ha" ditches should be wide enough for an elephant to turn around, have a soft, dry bottom, and should include a gradually sloped ramp so that the elephant can easily climb out of the moat or ditch.

1.4.9.3 Doors and gates

Standard: Doors and gates must be in good condition and must be engineered to withstand an elephant's strength.

Measurement: All doors and gates must operate properly and contain elephants. No elephant injuries or keeper injuries because of hydraulic or electrically-powered door operation.

Explanation: Door and gate design is extremely important to ensure the safety of both elephants and keeper staff. If hydraulic or electrically powered drives are used to operate doors or gates, there must be a manual back-up system or a back-up generator in place in case of failure. Door operation must be continually monitored with a direct line of sight or with video the entire time the door is in motion in order to prevent elephant or keeper injury.

1.4.9.4 General exhibit considerations

Standard: Ceiling and fixture heights (e.g., lights, heating units, plumbing, etc.) must be built so that elephants do not harm themselves or damage the facility.

Measurement: There should be no elephant injuries due to poor design or insufficient heights of ceilings and fixtures.

Explanation: Mature elephants can reach a vertical height of 24 ft (7.3 m).

1.4.9.5 Safety program

Standard: Each elephant-holding institution must have an established method of regularly evaluating its elephant facility and program safety. The institution must document and be able to demonstrate how this established program assesses safety on a regular and consistent basis and how safety issues are resolved.

Measurement: Program and facility safety evaluations and safety issue resolutions are documented. All identified safety issues are resolved or in the process of resolution.

Explanation: Each facility should establish a safety assessment program based on its own needs and resources. A Safety Program may include a safety assessment team, including elephant staff, management staff, animal health care staff and experts in the area of risk management and safety. Facilities are recommended to conduct safety evaluations at least semi-annually.

1.4.10. Transport (in accordance with IATA)

Standard: All applicable Federal regulations and/or IATA requirements must be met.

Measurement: Elephant transports have been accomplished safely and in an appropriate manner.

Explanation: The method of transport, as well as preshipment health screening protocols, should follow TAG/SSP guidelines. For specific standards for the transport of elephants, see the Elephant Husbandry Resource Guide and Fowler (1995).

1.4.10.1. Type of transport container

Standard: See 1.4.10

Measurement: See 1.4.10

Explanation: Elephants are typically transported in custom semi trailers, specifically designed for moving elephants. On occasion, elephants are moved in crates, most commonly for overseas shipments.

1.4.10.2. Appropriate size of transport container

Standard: See 1.4.10

Measurement: See 1.4.10

Explanation: The crate or trailer compartment used for shipping should be sized so that the elephant can stand up comfortably, but not turn around. The elephant should not be compressed by the containment front or back. The crate should be equipped with tethering options as needed.

1.4.10.3. Provision of food and water during transport

Standard: See 1.4.10

Measurement: See 1.4.10

Explanation: Elephants should be provided with food (e.g., hay) and water at regular intervals during the transport.

1.4.10.4. Provision of bedding or substrate in transport container

See 1.4.10

1.4.10.5. Mechanism(s) for separating animal from urine and feces during transport

See 1.4.10

1.4.10.6. Temperature range during transport

See 1.4.10

1.4.10.7. Light levels and how to minimize noise during transport

See 1.4.10

1.4.10.8 Group size or need for separation of individuals during transport

See 1.4.10

1.4.10.9 Handler/veterinarian access to animal during transport

See 1.4.10

1.4.10.10 Duration of transport allowable before temporary transfer to "normal housing" is required

See 1.4.10

1.4.10.11 Timing of release, size and type of enclosure at transport destination

See 1.4.10

1.5 Water

1.5.1 Acceptable water quality parameters

Standard: Water suitable for drinking must be made available daily. Frequent drinking opportunities throughout the day may be necessary to meet the elephant's needs in the ambient environment.

Measurement: Water sources for exhibit and barn are identified and method of delivery determined to meet the standard.

Explanation: Most facilities provide either continually running or automatic watering devices in outdoor enclosures and barns. If these are not present, the method of providing water must be identified and written protocols in place to ensure appropriate water availability to the elephants.

1.5.2 Presentation of water, and water sources

Standard: While outdoors and weather permitting, elephants must have regular access to water sources, such as a pools, waterfalls, misters/sprinklers, or wallows that provide enrichment and allow the elephants to cool and/or bathe themselves.

Measurement: Outdoor water sources are present in sufficient quantity to accommodate all elephants at one time.

Explanation: It is recommended that pools be constructed with rounded edges, and without corners. Artificial pools should have either multiple or lengthy gently sloping exit and entrance areas, with non-slip surfaces, and at an angle no greater than 30°. Vertical sides on pools should be avoided in areas where elephants have direct access to the pool side. Steps should be wide enough for elephants to place more than one foot on at a time and small enough for baby elephants to step up or down. There should be more than one entry/exit point to the pool in order to prevent one elephant from inhibiting the exit or entrance of other elephants into or out of the pool.

1.5.3 Pool depth and need for variation in depth

Standard: There are no standards for pool depth and variation in depth at this time.

Explanation: It is recommended that one body of water or pool be deep enough to allow for buoyancy, as this can allow for non weight-bearing exercise and that it be deep enough to allow an adult to be fully immersed when laying on its side, or at least six feet deep.

However, shallow wading and splashing pools are also excellent activity areas for elephants and are to be encouraged. Recycled water over a waterfall or spraying out over the pool is an excellent activity stimulant.

2. Biotic Variables

2.1 Food and Water.

2.1.1. Containers and protocols for the provision of food and water

2.1.1.1 Water

Standard: See 1.5.1. When water containers are used, drinking water must be cleaned and refreshed daily. Containers must also be cleaned daily.

Measurement: Water sources are clean and water is fresh.

Explanation: The ability to monitor water consumption by the elephants may be important in sick or compromised elephants.

2.1.1.2 Food

See 3.1. Other resources include the Elephant Husbandry and Resource Guide, Appendix 1, Nutrition Advisory Group Handbook, "Elephants: Nutrition and Dietary Husbandry" (Ullrey et al. 1997).

2.1.1.3 Food items - Variability in food type

Standard: Elephants must be offered a balanced diet composed of an appropriate variety of food items provided in quantities that are sufficient for each elephant to maintain appropriate body condition. Diets must be developed under the direction of the institution's nutritionist or veterinary staff. Consideration must be given to recommendations provided by the Elephant TAG/SSP Nutrition Advisor, as they become available.

Measurement: Diet sheets and written feeding protocols must be maintained and meet the Elephant TAG/SSP Nutrition Advisor recommendations. For the purpose of this section, elephant weights and body condition scores should be recorded three times a year.

Explanation: Nutritional content is a critical tool for assessing overall nutritional well-being. Daily intake records may also be valuable to maintain. Elephants have evolved to be generalist feeders. Recommended food items include hay (e.g., meadow or timothy), supplemented with fruits, vegetables, a pelleted supplement or grain. Fresh browse should be made available daily, if possible. Overall energy content of the diet must be assessed in relation to the body condition scores for each elephant and diet composition adapted as needed.

2.1.1.4 Feeding schedules - Variability food presentation (e.g. spatial and temporal dispersal of food resources)

Standard: Varied feeding schedules dispersed both spatially and temporally throughout the day and night are required.

Measurement: Written feeding protocols and schedules must be maintained.

Explanation: Mechanisms to deliver food to elephants during the day and night should be implemented (e.g., changing animal care staff schedules, automated feeders, hanging feeder nets, etc.). Feeders should be located in multiple locations to discourage undue competition or aggression over feed items.

2.1.1.5 Provision of opportunities for elephants to process food in ways similar to their wild counterparts and mechanisms that enable animals to work for food

Standard: Opportunities must be provided for elephants to acquire food using multiple foraging behaviors. Food must be provided in areas where it is less likely to be soiled. Excess or waste food must be removed daily.

Measurement: Written feeding and enrichment protocols must be maintained.

Explanation: Opportunities for searching, browsing, grazing, reaching, opening, etc. can be provided by scatter-feeding, hiding foods in crevices and substrates around the exhibit, or by using elevated feeders such as hanging hay nets that encourage an elephant to reach for and manipulate its trunk to gain access to the food. Mechanisms that promote physically active feeding behaviors can be incorporated into a comprehensive enrichment plan for the elephants.

2.2 Social Considerations

2.2.1 Group Composition

2.2.1.1 Suggested age and sex structure of social group

Standard:
Each zoo holding elephants must hold a minimum of three females (or the space to hold three females), two males or three elephants of mixed gender. If a zoo cannot meet this standard, they must apply for a variance. Before the variance can be issued by the Accreditation Commission the zoo (a) must describe their plan to obtain additional elephants or describe their plan for deacquisitioning their elephants and (b) must describe what will occur if they experience the loss of one elephant. In most cases where an institution has one remaining elephant, the remaining elephant will receive a recommendation for relocation at another AZA institution from the Elephant TAG/SSP.

Adult males (6 years and older) may be housed alone, but not in complete isolation. Opportunities for tactile, olfactory, visual, and/or auditory interaction with other elephants must be provided (Rasmussen et al. 1982).

By 1 September 2016, no further variances will be issued.

Measurement: The institutional commitment to elephants must be reviewed if the institution is not in compliance with the Standard. Plans for meeting the Standard and a timeline must be submitted to the Elephant TAG/SSP and to the Accreditation Commission. The Elephant TAG/SSP will determine acceptable animal welfare and plans.

Explanation: Due to multiple species differences and possible disease transmission issues, when forming new herds, Asian and African elephants should not be placed together in the same enclosure.

2.2.1.2 Temporary individual care of parturient females and young, or of males, and corresponding adequate and appropriate space for animals when removed

Standard: All facilities must include the ability to flexibly manage the elephant herd, allowing the separation of groups or individuals as required.

Measurement: Each institution must be able to demonstrate and/or describe how they would successfully isolate individuals or groups as needed for elephant management or care.

Explanation: The ability to adapt to changing conditions and situations is critical to the success of any elephant program.

2.2.1.3 Male elephant socialization

Standard: If males are housed, separate facilities for isolation must be available, and a program of social contact in place**.**

Measurement: Each institution must be able to demonstrate and/or describe how they would successfully isolate and socialize males.

Explanation: Males (six years and older) may be housed alone, but not in complete isolation; opportunities for tactile, olfactory, visual, and/or auditory interaction with other elephants must be provided (Rasmussen et al. 1982). In the wild adult males are primarily solitary. However, they do have regular contact with other elephants.

2.2.1.4 Nursery groups (groups of mothers with most recent young)

Standard: Isolation facilities for birth and postpartum management must be available.

Measurement: Each institution must be able to demonstrate and/or describe how they would successfully isolate mothers and calves during birth and postpartum period. Written protocols must be in place for births and reintroductions of mothers/calves to herd.

Explanation: First time mothers in particular may require significant management. Initial protection of the calf and control of the mother are critical to a successful birth. Introduction of the new calves and mothers to the herd must be accomplished both cautiously and expeditiously. Reintroduction of the calves and mothers to the natal group or herd should be accomplished as quickly as possible.

2.2.1.5. "Emigration" of adolescents

Standard: Offspring should remain with their mothers until they are weaned and mother and calf are acclimated to separation.

Measurement: Offspring must remain with their mothers until they are at least three years old.

Explanation: Some flexibility is necessary in cases of health challenges, maternal rejection and/or when infants cannot be re-established in their social group. In cases of maternal rejection, calves should be introduced to other conspecifics as soon as possible. Males are generally separated from the herd during adolescence due to natural age-related behavioral changes. There is no specific age when this may occur. Indicators that males may need to be separated include aggression, play-fighting or reproductive behavior that causes disruption within the herd or risk of injury to individuals in the herd.

2.2.1.6 Multigenerational groups

Standard: When possible, multigenerational groups should be maintained.

Measurement: Multigenerational groups are maintained when possible.

Explanation: Multigenerational groups are a goal of the TAG/SSP breeding program. Much of the behavioral repertoire of elephants is learned, rather than innate. A multi-generational group allows the transfer of species-appropriate behaviors within a herd through experience and observational learning.

2.2.1.7 Groups deriving from cohorts

See 2.2.1.8

2.2.1.8 All male groups

Standard: There are no standards for all male groups at this time.

Explanation: Guidelines for the creation and long-term management of all-male elephant groups will need to be developed as this may become increasingly more important with increased breeding success and the production of more male calves.

2.2.1.9 Daily and life stage variation in patterns of social affiliation

Standard: A behavioral profile must be maintained for each individual elephant and updated annually.

Measurement: Protocols and profiles in place and up-to-date.

Explanation: Staff must be aware of each elephant's social compatibility and the dominance hierarchies of the herd. Institutions must have the ability to manage social compatibility as well as dominance and aggression among an elephant group. Institutions must have the ability to manage introductions and separations of elephants, including; a new female to an existing herd, females to males for breeding, calves to their mothers, and calves and mothers to the herd. Elephant enclosures must be designed to allow for separate and group housing during periods of social incompatibilities, without interfering with the normal movement of elephants in and out of enclosures.

2.2.2. Group Size

2.2.2.1 Minimum and optimum group sizes

See 2.2.1.1

2.2.2.2 Inter-individual distances required

Standard: Facility must be designed, and resources provided, to allow for ample feeding, shade, water, and wallowing locations.

Measurement: Facility must have sufficient structures for all elephants to participate in all ranges of natural behaviors.

Explanation: Elephants are a social species and herds often perform activities together, such as feeding, drinking, walking, resting, and wallowing.

2.2.3. Conspecific groups, the need for/influence of adjacent groups, similar taxa, or territorial species

More research is needed to develop guidelines for this section.

2.2.3.1 Key environmental elements for each species

More research is needed to develop guidelines for this section.

2.2.3.2 Identify inter-specific inter-animal distances require

More research is needed to develop guidelines for this section.

2.2.3.3 Address appropriateness of single-sexed groups

More research is needed to develop guidelines for this section.

2.2.4 Introductions

Standard: Institutions must have the ability to manage elephant introductions and separations.

Measurement: There must be appropriate facilities and protocols in place for all phases of elephant introductions.

Explanation: All institutions must have the staff and the appropriate facilities to be able to manage both elephant introductions and separations, including introductions/separations of a new female to a herd and, if the institution is a breeding facility, females to males for breeding, newborn calf to its mother, and calf and mother to the herd.

3. Health and Nutrition

3.1 Diet - Standards for nutrient requirements for all life stages

See 2.1.1.3, 2.1.1.4 and 2.1.1.5. Other resources include Food, the Elephant Husbandry and Resource Guide, Appendix 1, Nutrition Advisory Group Handbook, "Elephants: Nutrition and Dietary Husbandry" (Ullrey et al. 1997).

Standard: Elephant weights and body condition scores should be recorded three times a year. For Asian elephants, the Wemmer body condition index (BCI) can be used (see Appendix 2) and body condition index scores in the 6 to 10 range should be maintained. (See Appendix 2). Diet and/or exercise programs must be in place for elephants.

Measurement: Weight records and body condition scores should be reviewed. Diet and exercise programs modified as needed to maintain elephant physical well-being.

Explanation: Elephants may be outside the normal body condition score range and still be healthy. These individuals may not need to have specialized diet or exercise plans in place.

3.2 Influence of the following variables on dietary requirements

3.2.1 Age (infant, juvenile, reproductive adult, senescent adult, etc.)

See Appendix 1

Explanation: Obesity is a health concern for all animals, including elephants, and excessive weight gain should be avoided through proper diet and exercise. For infants, a normal growth rate should be 1 to 2 lbs per day over the first three years. Excess weight early and too rapid growth may cause long-term harm to the elephant's physical well-being. Significant exercise and limiting the high-energy supplements will help control weight gain in calves and elephants of all ages.

3.2.2 Body size

See 3.1

3.2.3 Reproductive status

Standard: Elephants' diets should be carefully monitored during pregnancy, and elephants should engage in a prenatal exercise program to control excessive weight gain during pregnancy.

Measurement: Weight records and body condition scores should be reviewed.

Explanation: Elephants should be prevented from significant weight gain during pregnancy.

3.2.4 Seasonal changes in ambient temperature

Not a significant factor for elephants.

3.2.5 Seasonal changes in body condition

Generally not an issue with our elephant population.

3.2.6 Seasonal changes in nutritional requirements

Standard: Elephants should be fed in accordance to the recommendations of the Elephant TAG/SSP Nutrition Advisor.

Measurement: Diet sheets and nutritional/intake records should be reviewed.

Explanation: If changes are made to diets as a result of seasonal availability of items, then care should be taken to implement changes gradually (over 1-2 weeks) to avoid digestive upsets (Ullrey et al. 1997).

3.2.7 Activity levels

Standard: Activity levels should be sufficient to maintain the physical and psychological well-being of the elephant.

Measurement: Diet sheets, weight records, body condition scores, exercise protocols and nutritional/intake records should be reviewed.

Explanation: In the absence of scientific data to indicate the precise amount of activity needed to maintain good physical and psychological well-being of an elephant, activity levels, weight, BCI and diet composition should be frequently reviewed to maintain appropriate overall health parameters.

3.2.8 Health status

Standard: Diets should be flexible and should be adaptable to a wide range of individual elephant needs and various health issues, while adhering to the recommendations of the Elephant TAG/SSP Nutrition Advisor.

Measurement: Diet sheets, weight records, health records and nutritional/intake records are reviewed.

Explanation: The elephant team must work closely with the veterinary and nutrition teams to balance medical and nutritional requirements with behavioral components and activity levels for each elephant.

3.2.9 Palatability, texture, processing, etc. that will encourage species-appropriate appetitive behaviors

Standard: Every institution must have a browse program/protocol as a part of their elephant management program.

Measurement: Browse protocol and elephant health/dental records should be reviewed.

Explanation: Elephants must be provided with browse material large enough to avoid molar impaction and rotation. Since elephant teeth migrate forward (not vertically), it is important that the right type of food is offered to promote dental health and allow for the natural progression of each molar.

3.3 Medical management

Standard: A veterinarian with experience in large mammal medicine must be on call at all times to deal with routine elephant health evaluation and treatment and medical emergencies.

Measurement: Records of annual medical exams and other treatments must be on file. Copies of AZA Elephant TAG/SSP medical protocols should be on file and utilized at the institution.

Explanation: Guidelines for routine exams, quarantine, preshipment testing and necropsy are available from the AZA Elephant TAG/SSP Veterinary Advisor.

3.3.1 Quarantine and hospitalization

Standard: Quarantine protocols, periods and parameters for elephants must be in place.

Measurement: AZA Elephant TAG/SSP protocols available along with institutional written protocols.

Explanation: Due to the size, strength, and social nature of elephants, it may be logistically difficult to maintain isolation from other animals during arrival and quarantine. The Recommended Preshipment Protocol for Elephants lists a comprehensive battery of tests to detect disease prior to shipment. It is important that the receiving institution work closely with the sending institution to ensure that all (or as many as possible) of the listed tests are conducted and results reviewed. Following the preshipment protocol may help compensate for some of the quarantine compromises that may be required. Regardless of preshipment test results, every attempt should be made to maintain some degree of physical separation from the resident elephants after arrival.

Current quarantine practices recommend a minimum 30-90 day quarantine period for most species found in zoos and aquaria. Social concerns, physical facility design, and availability of trained elephant staff may dictate a modified quarantine protocol. The final decision for specific quarantine protocols at each institution should be made by the veterinary staff in consultation with the elephant management staff. For additional information, refer to the Elephant Husbandry Resource Guide, AZA Quarantine Guidelines, and the AAZV Preventive Medicine Recommendations.

3.3.1.1 Problems arising from isolation of social taxa

Standard: Every institution should have the ability to introduce, manage and maintain social groupings of elephants.

Measurement: Daily records of social groupings should be reviewed. Introduction protocols/records should be reviewed.

Explanation: As a highly social species, female elephants must be returned to their social group as soon as possible. Although interaction between elephant care staff and elephants can be beneficial, they are not a sufficient substitute for species-appropriate elephant-to-elephant interactions.

3.3.2 Preventive medicine (testing, vaccinations, parasite control, etc.)

Standard: Each elephant must be given a thorough annual physical examination (Mikota et al. 1994). Elephant weights and body condition scores should be recorded three times a year.

Measurement: Written documentation of the exams and their results, the weights and the body condition scores taken at the time of each weight must be reviewed. Written protocols are in place for all preventative elephant medicine and AZA Elephant TAG/SSP guidelines available.

Explanation: Institutions must adhere to USDA Animal and Plant Health Inspection Service (APHIS) requirements for testing and treatment of tuberculosis. A veterinarian or trained veterinary technician must perform fecal examinations to look for parasites and other

problems on a regular basis (Samuel et al., 2001). Results must be recorded. Body weights and body condition must be assessed and recorded at least three times a year, through actual weighing or through the use of standardized body measurement tables, photographs, or similar, previously validated techniques (e.g., Sreekumar and Nirmalan, 1990). These results must be reviewed after each measurement is taken. Regular vaccinations, as determined by the veterinary staff in concert with the Elephant TAG/SSP Veterinary Advisor, must be given. Annual vaccinations may include rabies and tetanus.

3.3.2.1. Daily care

Standard: All elephants must be visually inspected on a daily basis

Measurement: Daily records and reports must be reviewed.

Explanation: An assessment must be made and any unusual behavior, physical characteristics or activities should be immediately reported to the supervisor, and recorded in a daily log. Specifically, reports should include observations such as condition of urine and feces, eating and drinking patterns, administration of medications (if any), and general condition and behavior.

3.3.2.2 Foot care

Standard: The elephants should be free of foot injuries or foot disease. Staff must be trained to provide foot care and the elephants must be trained to accept that care. Each elephant facility must have a written protocol for foot care. If foot injuries or foot disease are present, a current treatment regimen must be in place.

Measurement: Elephant feet are in good condition and need only periodic pad and nail trimming. Records and protocols on file and foot care and/or treatment protocols in place. Implementation of the protocols/treatment is evident in condition of the elephant's feet.

Explanation: An institution's foot care protocol should include daily cleaning and inspection of all elephants' feet. If foot injury or disease is present, evidence should be documented of the institution's review of the potential cause or causes of the foot injury or foot disease. Where causes are identified, changes made to address these causes must be documented. Taking baseline foot radiographs or thermographs of all adult elephants and keeping them on file is suggested. In some cases, it may be appropriate to annually monitor selected elephants (i.e., those that have a history of chronic foot problems).

3.3.2.3 Skin care

Standard: Elephants must be trained to accept regular skin care and staff must be trained to provide that care.

Measurement: Each elephant facility must have a written protocol for routine skin care and show evidence of its implementation. These records and protocols should be reviewed.

Explanation: An elephant's skin must be thoroughly inspected on a daily basis and cared for as needed through bathing, removal of dead skin, and treatment of dry skin or other skin problems. The elephant's skin should be supple, free of dead skin buildup, not cracked or dry and free of folliculitis.

3.3.2.4 Daily exercise

Standard: An exercise program must be in place for the herd as a whole or for each individual elephant.

Measurement: Each elephant facility must have a written protocol for routine exercise and show evidence of its implementation. These records and protocols should be reviewed.

Explanation: Elephant weights and body condition scores should be recorded three times a year. For Asian elephants, the Wemmer body condition index (BCI) can be used (see Appendix 2) and body condition index scores in the 6 to 10 range should be maintained. Exercise protocols should be in place for maintaining good body condition and exercise should be increased for elephants over the optimal body condition score. True exercise levels required for elephants, measured in distances walked per day, are not known. Recent data collected from radio collared wild elephants indicates much shorter daily travel distances than previously reported. Current studies are in progress on distances traveled daily by elephants by several research groups and in several AZA institutions. The weight and the body condition score, combined with the absence of disease, foot and leg problems are the indicators that the amount of exercise is sufficient for the elephant on their specific diet in their specific situation. As with humans or any other species, overall health is a combination of factors, including exercise, diet and psychological factors.

3.3.2.5 Husbandry training

Standard: All elephants must be trained to reliably present he behaviors listed on the AZA Standard Elephant Program Behavioral Components checklist. All elephants must be trained to permit a complete body exam daily and to allow successful completion of all necessary care and husbandry procedures.

Measurement: The AZA Standard Elephant Program Behavioral Components checklist should be completed by the institution annually, and maintained for review at accreditation.

Explanation: The key to keeping elephants healthy and treating them when they are sick relies on the ability to monitor, test and administer health care and treatment. Proactive training makes monitoring elephant health possible and makes diagnostic testing and

therapeutic treatment in times of compromised health less stressful for the elephant and the elephant care team.

Checklist of AZA Standard Elephant Program Behavioral Components
If individual elephants vary, please note the number of elephants that fall into each category.

BEHAVIOR	NOT TRAINED	IN TRAINING	COMPLETE & RELIABLE
Bathe / scrub skin			
Treat skin			
Trim all feet			
Eye exam			
Ear exam			
Mouth exam			
Tooth exam			
Tusk exam			
Tusk trim			
Blood collection (note frequency of collections)			
Urine collection			
Vaginal exam			
Rectal palpation			
Enema			
Transrectal ultrasound			
Accepts injections			
Accepts oral medications			
Enters chute (remains inside with doors closed)			
Allows chute walls to move			
Allows husbandry procedures to be performed by staff			
Allows veterinary procedures to be performed by vet			
Trunk wash for TB testing			
Foot x-ray			
Separation			
Leg restraint			
Reproductive assessment completed			

3.3.2.6 Elephant Restraint Devices (ERD)

Standard: All elephant facilities should have an ERD. If a facility does not have an ERD, staff must demonstrate a method of restraint that allows necessary husbandry, veterinary, and reproductive procedures to occur in a safe and efficient manner for all elephants in their collection. Use of the ERD must not be weather dependent.

Measurement: ERD in place and functional. All elephants trained to use the ERD, or the institution demonstrates its protocols and ability to do ERD functions without the ERD.

Explanation: ERDs must effectively restrict the movement of an elephant while simultaneously allowing elephant care staff access to the elephant for veterinary procedures. ERDs must be able to comfortably contain an elephant for prolonged veterinary or husbandry procedures

3.3.2.7 Restraint Use

Standard: All elephants must be trained to allow restraint using ERDs, rope, chain, or other materials of sufficient strength. Elephants must not be subjected to unnecessary prolonged restraint. Any planned restraint over two hours must be approved by the institution's administration, elephant management committee, and veterinarian. The institution's safety committee and/or the institutional animal welfare committee should be included in the decision making process. All new construction and major renovations must be designed in a manner that minimizes the regular need for tethering.

Measurement: Protocols in place for tethering guidelines are reviewed.

Explanation: Tethering is an acceptable method of temporary restraint for elephants. Prolonged tethering may be necessary for transport and for veterinary treatment. Elephants can be easily trained to accept tethering.

3.3.2.8 Immobilization

Standard: Veterinary protocols must be established for potential immobilization of an elephant, either for standing or full sedation.

Measurement: Veterinary immobilization protocols are reviewed.

Explanation: The Elephant TAG/SSP Veterinary Advisor can be consulted for the most current and effective sedation and immobilization techniques.

3.3.2.9 Management of neonates and geriatric animals

Standard: Neonatal exam and hand-rearing protocols must be part of the written birth protocols. Management and treatment plans for each geriatric elephant should be developed by the elephant management team and veterinarian and revised regularly as the elephant ages.

Measurement: Birth protocol is reviewed, including plans for neonatal exam and hand-rearing. Geriatric management and treatment plan is reviewed.

Explanation: Specific treatment for geriatric elephants will be developed with coordination of the veterinary and management teams. There are no current specific standards. The Elephant Husbandry Resource Guide includes a chapter on hand-rearing and can be a useful resource in the development of a facilities hand-rearing protocol.

3.3.2.10 Management during pregnancy

Standard: Pregnant elephants must have a written diet and exercise program to prevent excessive weight gain during pregnancy.

Measurement: Birth protocol is reviewed, including plan for exercise and diet management during pregnancy.

Explanation: An elephant that is overweight at time of parturition significantly increases the risk of dystocia and other parturition complications. Elephants in good body condition should gain no more than 5% of their body weight during pregnancy.

Nulliparous females over age 24 years have had limited success delivering calves and have experienced dystocias and retained fetuses. Institutions should take all factors into account and research the potential challenges and options available when considering breeding elephants in this reproductive class.

3.4 Reproduction

3.4.1 Seasonal changes in physiology and behavior associated with reproduction and management implications of such changes.

Standard: Each male and female elephant of potential reproductive age must have an initial reproductive assessment and follow-up assessments on a regular basis by transrectal ultrasound, and all female elephants of potential reproductive age must have their progesterone cycle monitored to verify current reproductive status and assess overall reproductive health.

Measurement: Samples for reproductive assessment for females taken and analyzed at least annually. Semen samples collected from bulls regularly (annually where practical) document current viability. AZA Elephant TAG/SSP recommendations followed.

Explanation: Exceptions for reproductive assessment include elephants with known reproductive problems, actively breeding elephants, or those with documented medical/behavioral conditions that preclude them from breeding.

3.4.2 Facilities for parturition and management of females during parturition and calf introductions

Standard: Breeding facilities must have a birth protocol in place, which provides for care of the mother during pregnancy and parturition and safety of the calf immediately after birth.

Measurement: Birth protocol is reviewed.

Explanation: In order to avoid incidents of calf injury or unsuccessful births due to lack of a plan or lack or preparedness, a detailed birth protocol must be written for all pregnant elephants. For first time mothers, this protocol must include the ability to restrain the mother

and retrieve the calf at parturition if necessary. The protocol must include methods of care of the mother in case of birth complications requiring veterinary intervention. There are several excellent birth protocols available from successful breeding institutions. The Elephant Husbandry Resource Guide is also a valuable reference for developing the institutional birth protocol**.**

3.4.3 Hand-rearing and reintroduction protocols

Standard: Written hand-rearing and reintroduction management plans should be included as a part of the birth protocol.

Measurement: Birth protocol is reviewed, including plans for hand-rearing and reintroduction management.

Explanation: Protocols must be in place and supplies on hand well in advance (at least 30 days) of earliest expected parturition date in case hand-rearing is necessary. Every attempt should be made to reunite an elephant calf with its mother as soon as possible following birth. Of calves that have been hand-raised, only 50% have survived. Detailed information on the hand-rearing of elephant calves can be found in the Elephant Husbandry Resource Guide as well as the Elephant Hand Raising Notebook (Kinzley, 1997).

3.4.4 Recommended means and duration of contraception

Standard: There are no standards for contraception with elephants at this time.

Explanation: Currently, there is not a need for contraception with either African or Asian elephants in human care. Contraception information is available on-line at the AZA Wildlife Contraception Center's web site at www.stlzoo.org/contraception.

4. Behavior management

Standard: All institutions must have a training program in place which allows elephant staff and veterinarians the ability to accomplish all necessary elephant care and management. A training program must be consistent with the industry standard to assure inter-institutional consistency.

Measurement: Review training and health records and observe elephant/staff interactions to determine if elephant training program is successful and that elephant care needs are being successfully met.

Explanation: Elephant training terminology and descriptions of specific behaviors are outlined in the PEM Course Notebook (AZA Board of Regents 2001). The PEM-recommended list of commands and their corresponding behaviors are ones that every elephant and elephant keeper must know so that basic husbandry and veterinary practices can be accomplished.

4.1 Successful methodologies for managing elephants

4.1.1 Training methods

Standard: Each institution will adopt and implement an institutional training methodology that promotes the care and management of the elephants for routine husbandry, medical management, physical well-being and overall elephant welfare while emphasizing keeper and visitor safety. Each AZA member institution and related facility that holds elephants must have a written elephant management policy. This policy must be consistent with AZA standards for elephant management and care, and must, at minimum, include a description of the following key components:

a) Elephant management program's missions and goals.
b) Elephant management policies, including guidelines for handling, training, and transport.
c) Plan to separate elephants from each other, safely manage elephants that are aggressive towards other elephants, safely move elephants from one location to another, and safely manage elephants that are aggressive toward humans.
d) Staff management policies, including guidelines for keeper safety.
e) Individual elephant profiles and incident reports for all cases in which elephants show aggression toward keepers or the public, regardless if any injury actually resulted.
f) Emergency response protocols. Institutions must be able to demonstrate readiness to respond to an emergency situation, such as an elephant escape, or keeper injury, or to natural disasters.
g) Written protocol for routine foot care and evidence of its implementation
h) Written environmental enrichment plan and evidence of its implementation
i) Written exercise plan and evidence of its implementation

Measurement: Institutional Elephant Management Policy and all records pertaining to elephant care and or management are reviewed. Institution must be able to demonstrate that all AZA Standards for Elephant Management and Care are met.

Explanation: Appropriate elephant training may employ several training aids or "tools" (see PEM Course notebook for a list and description of some elephant training tools and procedures). If properly executed training procedures are ineffective in eliminating aggressive or inappropriate behavior in a given elephant, institutions should consider other alternatives, including transfer to a facility with more experienced staff or a different management system.

Different elephant training methodologies have both advantages and disadvantages. AZA standards for elephant management recognize that a diversity of approaches exist, but encourage members to continue to experiment with the goal of maximizing elephant health and reproduction, and minimizing risk of injury to keeper staff. System definitions have been defined in the PEM Course and are as follows:

a. Free Contact – The direct handling of an elephant when the keeper and elephant share the same unrestricted space. Neither the use of chains nor the posture of the elephant alters this definition.

b. Protected Contact – Handling of an elephant when the keeper and the elephant do not share the same unrestricted space. Typically in this system the keeper has contact with the elephant through a protective barrier of some type while the elephant is not spatially confined and is free to leave the work area at will. This includes confined contact, where the handling of an elephant through a protective barrier where the elephant is spatially confined, as in an Elephant Restraint Device (ERD).

4.2 Procedures successful in facilitating introductions, including separation of individuals from group, stationing, tolerance while feeding, cooperative feeding, "howdy" units, visitation gates, etc.

Standard: Protocols must be in place for safe and effective introductions and control of potential social issues.

Measurement: Institution must be able to demonstrate their ability to introduce and separate elephants.

Explanation: Gradual introductions generally follow a pattern of increasing familiarity as follows: olfactory and auditory contact, visual contact at a distance, close proximity visual contact, tactile contact over or through a barrier that allows for either individual or group to move at choice out of tactile contact range, and finally full unfettered introduction. Each phase should be observed and evaluated before moving to the next introductory phase. When doing full introductions, it is important to maintain the ability to intervene in any aggressive escalation and be able to either provide sufficient open or barrier enhanced space for one elephant to avoid another, or multiple gates to facilitate safe separation of the elephants. It should be cautioned that some elephants are able to very rapidly move through the introductory stages and may become frustrated or increasingly aggressive if the introduction moves too slowly. Hence, continual behavioral assessment of the introduction is important.

4.3 Enrichment programs

Standard: All institutions must have a written environmental enrichment plan for their elephants and show evidence of implementation (See 1.4.6).

Measurement: Enrichment plan and records of daily enrichment activities should be reviewed.

Explanation: An effective enrichment program should promote species-appropriate behaviors. More comprehensive information on enrichment programs for elephants can be found in the Elephant Husbandry Resource Guide and at www.animalenrichment.org.

5. Management Structure, Safety and Program Assessment

5.1 Management Structure, Technical Skills and Competencies

Standard: Each institution must demonstrate a management structure which provides (1) staff training; (2) developing and maintaining the program; and (3) communicating with others about the elephant program. The elephant manager(s) must have attended the PEM course. The elephant program's manager(s) must demonstrate knowledge about all emergency protocols and continually improve elephant management techniques as the industry standards evolve. Overall responsibility for the program must be clearly defined.

Measurement: Institutional elephant management responsibility is designated, has attended PEM and is knowledgeable in institutional elephant protocols. Written training protocol in place.

Explanation: Most institutions typically assign one person to be the Elephant Manager, however, some institutions have more than one person sharing the duties described above. Every elephant keeper and senior curatorial staff responsible for the elephant program is encouraged to attend the PEM course. The Board of Directors has directed the Professional Development committee to develop a mechanism for the PEM graduates to remain current in best practices in elephant management. The elephant keeper training plan should include regular check-ins with the elephant manager(s) in order to assess the new employee's progress in handling the elephants at his or her facility.

5.2 Animal and keeper safety

Standard: A minimum of two qualified elephant keepers must be present within visual and auditory contact during any contact with elephants (any time a keeper is within trunk's reach of an elephant).

Measurement: A record of all elephant-related keeper injuries or aggression directed at keepers should be kept. Related keeper injuries or aggression directed at keepers and elephant behavioral profiles should be reviewed annually.

Explanation: A qualified elephant keeper is a person the institution acknowledges as a trained, responsible individual, capable of and specifically experienced in the training and care of elephants.

5.3 Visitor Safety and Acceptable forms of human/animal interaction

Standard: Elephant enclosures must be designed to ensure that no physical contact is possible between the visitors and the elephants that is not directly supervised and under the control of trained elephant staff.

Measurement: No incidents of visitor injury or inappropriate contact with elephants.

Explanation: All elephant/human interaction must be supervised by institutionally qualified elephant staff. Where elephant rides are done, or elephants are walked in public areas or outside their normal exhibit containment, protocols, assessments and reviews must be documented to ensure staff and public safety.

5.4 Program Assessment

Standard: Each program must perform an annual review of its overall elephant management program, including any elephant related injuries or safety incidents, elephant management policies and procedures, elephant containment parameters and structures, staff performance and program goals.

Measurement: Written report of the annual program assessment with recommendations for actions to be taken where appropriate.

Explanation: Elephant management continues to evolve as new information, knowledge and technologies become available. An annual review of the entire program will assist in identifying areas of unwanted change, assessing programs strengths and needs, and developing action plans to address meet the goals of the program.

6. Conservation, Education, and Research

6.1 Conservation and Research Activities

Standard: AZA Zoos should contribute to *in situ* and *ex situ* conservation and research efforts.

Measurement: Records of participation *in situ* and *ex situ* conservation and research efforts should be reviewed.

Explanation: AZA zoos that currently exhibit or desire to exhibit elephants should make every effort to maintain elephants in their collections so that they can contribute to conservation through public education, scientific research, and the support of field conservation. Elephants are an important flagship species and the cornerstone of many members' African and Asian exhibit areas. (Board of Directors 3/21/00). Every institution should contribute in some way to *in situ* conservation of elephants and their habitats (EMA 1999, Hutchins and Smith, 2000). AZA members are strongly encouraged to provide financial, personnel, logistical, and other support for priority research and conservation initiatives listed in the AZA Elephant TAG/SSP Action Plan (Wiese and Hutchins 1994). Every institution should contribute in some way to elephant research activities (Keele and Dimeo-Ediger 1997, EMA 1999, Hutchins and Smith, 2000). Involvement in one or more of the following disciplines is strongly recommended: behavior, cognition, reproduction, communication, enrichment, health (disease/pathology, nutrition), and education.

6.2 Education Programs

Standard: Every institution should institute a program to educate zoo visitors about elephant and elephant conservation issues (EMA 1999, Hutchins and Smith, 2000).

Measurement: Records of elephant education program should be reviewed.

Explanation: Assistance is available from the Elephant TAG/SSP Education Advisor. Every institution should have up-to-date educational graphics and/or information about elephants on display to the public.

7. Cooperative management

Standard: All acquisition, disposition, transfer or breeding of elephants in AZA institutions is subject to approval of the AZA Elephant TAG/SSP. All breeding, management and transfer recommendations of the AZA Elephant TAG/SSP should be followed. The success of cooperative breeding programs depends on all institutions supporting TAG/SSP recommendations.

If differences regarding TAG/SSP recommendations occur between the TAG/SSP Steering Committee and a member institution, AZA's Full Participation Policy clearly articulates the process that both parties must utilize to resolve them prior to engaging in the Animal Management Reconciliation process. However, if such differences cannot be resolved, then the parties involved must request that AZA's Wildlife Conservation Management Committee (WCMC) mediate the situation.

Measurement: Records of participation and cooperation with the Elephant TAG/SSP should be reviewed.

Explanation: The goals and mission of the Elephant TAG/SSP will only be met if each AZA institution managing elephants honors its commitment as either a holding or breeding facility. Each institution must make every effort to abide by Elephant TAG/SSP breeding and transfer recommendations.

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Appendix 1 - Nutrition

Table 1 - from Nutrition Advisory Group Handbook, "Elephants: Nutrition and Dietary Husbandry" (Ullrey et al. 1997).

Nutrient	Maintenance, Breeding	Late pregnancy	Lactation	Juvenile growth
Crude Protein, %	8-10[a]	12	12-14[b]	12-14[c]
Lysine, %	0.3	0.4	0.4-0.5	0.5-0.6
Calcium, %	0.3	0.5	0.5	0.5-0.7
Phosphorus, %	0.2	0.3	0.3	0.3-0.4
Magnesium, %	0.1	0.1	0.1	0.1
Potassium, %	0.4	0.4	0.5	0.4
Sodium, %	0.1	0.1	0.1	0.1
Sulphur, %	0.15	0.15	0.15	0.15
Iron, ppm	50	50	50	50
Copper, ppm	10	10	10	10
Manganese, ppm	40	40	40	40
Zinc, ppm	40	40	40	40
Cobalt, ppm	0.1	0.1	0.1	0.1
Iodine, ppm	0.6	0.6	0.6	0.6
Selenium, ppm	0.2	0.2	0.2	0.2
Vitamin A, IU/kg	3000	3000	3000	3000
Vitamin D, IU/kg	800	800	800	800
Vitamin E, IU/kg	100	100	100	100
Thiamine, ppm	3	3	3	3
Riboflavin, ppm	3	3	3	3

[a]Adult maintenance, 8% CP, breeding bull, pregnant cow (1st two-thirds of pregnancy), 10%CP.
[b]First year of lactation, 14% CP, 2nd year of lactation, 12% CP
[c]Weanling, 14% CP; 3-year old, 13% CP, 4-year old to year old, 12% CP.

Deficiencies in vitamin E in elephants in human care has lead to a range of symptoms, including necrotizing myopathies, anemia, reproductive failure (Kenny 2001), capture myopathy (Dierenfeld and Dolensek 1988; Barnett 1990), and white muscle disease (Dierenfeld and Dolensek 1988). Levels of circulating α-tocopherol in wild elephants have been recorded at 0.77 µg/ml; circulating levels in elephants in human care showing no clinical signs of vitamin E deficiency had an average level of only 0.43 µg/ml (Dierenfeld 1989). In order to increase circulating levels of α-tocopherol, supplementation of elephant diets with natural and artificial sources of vitamin E is recommended.

Grass hay with an ADF of > 30% should be provided to elephants (Ullrey et al., 1997), and can be mixed with legume hays. All hay fed should be of high quality, properly dried and cured, and regularly assessed for nutritional content (Oftedahl and Allen, 1996). To provide a more nutritionally complete diet, concentrated pellets can be offered in addition to hay. These pellets should be high-fiber and low in starch. Providing browse for elephants increases foraging time, can add important nutritional benefits, and can promote dental health. As with other food items offered to elephants, it is important to have browse nutritionally analyzed.

Appendix 2 – Body Condition Index

Criteria and point scores used to assess body condition in Asian elephants (*Elephas maximus*). When a particular body region is intermediate between two criteria, an intermediate point score (i.e. 0.5, 1.5 points) should be assigned.

A. Head - temporal depression (view from several angles)

- 2 points: full and convex in outline when viewed from behind (at the level of the neck or shoulder); frontal ridge vaguely outlined at best.
- 1 point: slightly to moderately concave; frontal ridge defined.
- 0 points: deeply concave; frontal ridge forms a crater-like rim around the temporal depression.

B. Scapula (shoulder blade) (view from side)

- 2 points: spinous process of the shoulder blade not visible, or slightly visible when the foreleg is in certain positions.
- 1 point: spinous process visible as a vertical ridge with a concavity between the ridge and the posterior edge of the scapula.
- 0 points: spinous process pronounced and bladelike with the acromial process pronounced as a knot.

C. Thoracic region (view from side)

- 2 points: ribs not visible, barrel smooth.
- 1 point: some ribs visible, but the extent and demarcation not pronounced.
- 0 points: many ribs strongly demarcated (even behind the scapula) with pronounced intercostal depressions.

D. Flank area - immediately in front of pelvic girdle (view from side and behind)

- 1 point: no depression visible; flank bulges outwards in front of the pelvis.
- 0 points: depression visible as a sunken area immediately in front of pelvis.

E. Lumbar vertebrae - behind ribs and in front of pelvis (view from behind, an elevated vantage point may be necessary)

- 2 points: not visible, lower back smooth and rounded.
- 1 point: visible as a ridge; skin slopes away from the top of the ridge; height of the vertebrae does not exceed width.
- 0 points: visible as a knife-like blade; sides of spinal ridge almost parallel, and the height equal to or exceeds the width.

F. Pelvic bone - external angle of the ilium (view from several angles)

- 2 points: not visible (or slightly visible); rump region between the ilium and caudal vertebrae filled with tissue (and not forming a depressed zone).
- 1 point: visible but not pronounced; the rump is a slightly depressed zone between the ilium and the caudal vertebrae.
- 0 points: visible as a jutting bone; rump is a pronounced sunken zone between ilium and the caudal vertebrae.