Animal Welfare Program Template
Your Zoo

Prepared by: Click here to enter text.

Revision Date: Click here to enter a date.
<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION 2</td>
</tr>
<tr>
<td>ANIMAL WELFARE IN ZOOS AND AQUARIUMS 4</td>
</tr>
<tr>
<td>INSTITUTIONAL ANIMAL WELFARE MISSION/VISION 6</td>
</tr>
<tr>
<td>THE ANIMAL WELFARE TEAM 8</td>
</tr>
<tr>
<td>INPUTS AND OUTPUTS FOR WELFARE ASSESSMENT AND MONITORING 10</td>
</tr>
<tr>
<td>SPECIES NATURAL HISTORY AND INDIVIDUAL ANIMAL HISTORY 14</td>
</tr>
<tr>
<td>ASSESSING WELFARE OF INDIVIDUAL ANIMALS 16</td>
</tr>
<tr>
<td>WELFARE CONSIDERATIONS/PROCESS FOR AMBASSADOR ANIMALS 28</td>
</tr>
<tr>
<td>WELFARE CONSIDERATIONS/PROCESS FOR FEEDER ANIMALS 31</td>
</tr>
<tr>
<td>ANIMAL TRAINING PROGRAM 33</td>
</tr>
<tr>
<td>ANIMAL ENRICHMENT PROGRAM 35</td>
</tr>
<tr>
<td>WELFARE CONSIDERATIONS FOR MEDICAL CARE AND TREATMENT 37</td>
</tr>
<tr>
<td>INSTITUTIONAL NUTRITION PROGRAM 40</td>
</tr>
<tr>
<td>LIFELONG CARE 42</td>
</tr>
<tr>
<td>EUTHANASIA PROCESS AND CONSIDERATIONS 44</td>
</tr>
<tr>
<td>WELFARE CONSIDERATIONS FOR PEST AND NUISANCE ANIMALS 46</td>
</tr>
<tr>
<td>WELFARE CONSIDERATIONS FOR SCIENCE AND CONSERVATION PROPOSALS AND PROJECTS 47</td>
</tr>
<tr>
<td>STAFF DEVELOPMENT IN ANIMAL WELFARE 49</td>
</tr>
<tr>
<td>ANIMAL WELFARE CONCERN PROCESS 51</td>
</tr>
<tr>
<td>APPENDIX A: NATURAL HISTORY AND INDIVIDUAL HISTORY QUESTIONS 53</td>
</tr>
<tr>
<td>APPENDIX B: SAMPLE INDIVIDUAL ANIMAL ASSESSMENTS 57</td>
</tr>
<tr>
<td>APPENDIX C: SAMPLE ASSESSMENT FOR GROUPS OF ANIMALS 64</td>
</tr>
<tr>
<td>REFERENCES 69</td>
</tr>
</tbody>
</table>
The welfare of animals within Association of Zoos and Aquariums (AZA) organizations has been a growing topic of consideration in recent years. As we learn more about the importance of the individual animal’s experiences, physical health, behavioral health and overall environment, we are challenged to find ways to assess the comprehensive welfare of animals on a consistent basis and ensure that animals residing in AZA institutions are given ample opportunities to thrive.

In 2017, AZA's Accreditation Commission added the following broad standard related to animal welfare:

**Standard 1.5.0** - The institution must follow a written process for assessing animal welfare and wellness.
Explanation: This process should be both proactive and reactive, transparent to stakeholders, include staff or consultants knowledgeable in assessing animal welfare, and quality of life for animals showing signs of physical or mental distress or decline.

The process should also include a mechanism to identify and evaluate the welfare/well-being of individuals and groups, the welfare/wellness impacts of significant life events or changes in the animal’s environment as identified by the individual institution. Examples of life events/changes could include construction events, unusual weather events, noise intrusion, change in housing, or changes in animals exhibited with or nearby, etc. Animal welfare/wellness refers to an animal’s collective physical and psychological states over a period of time, and is measured on a continuum from good to poor.

A comprehensive animal welfare program can provide a well-rounded approach to assessing and ensuring good welfare of our zoo and aquarium residents. The purpose of this document is to assist AZA members in developing institutional animal welfare programs and to address a multitude of factors that might be included in such a program.

This template includes a strong focus on welfare inputs, the factors that influence welfare, as well as outputs, the measurable outcomes of an individual’s welfare. With the current emphasis on supporting welfare assessments with scientific evidence, we have provided examples within each chapter where appropriate, of potential welfare outcome measures. Many of these outputs have not yet been scientifically validated; thus much of welfare assessments in zoos and aquariums will be more qualitative than quantitative – for now. These are works in progress. As we, as a community, acquire and apply more scientific evidence for various welfare variables, we will continue to improve the quality of these assessments and ultimately the wellbeing of the animals in our care. Further, we will commit to scientific validation of these outcomes, moving from more qualitative to quantitative assessments.

This document is intended for all staff caring for animals in a zoological institution. Specifically, animal care managers, welfare program champions, and directors can use this template to determine which aspects of a welfare program are desirable and appropriate for their organization. It is likely that each zoo and aquarium will use this resource differently: some might utilize it as a template for building an animal welfare program from the ground level up,
while others might use it as a reference for certain aspects of their existing welfare program. Whatever the need or desire, it is our hope that we have provided information and references that each organization can utilize to their desired extent in further developing programs that ensure excellent animal welfare.

How to use this document:

Within these pages are chapters that pertain to different aspects of animal welfare and components of a good, comprehensive animal welfare program. Included are brief introductions to each topic, information on how each topic pertains to animal welfare, as well as the AZA standards and requirements associated with each topic. Additionally, a short list of references is included at the end of each chapter.

This template is designed to provide a checklist of appropriate documents for each topic, as well as space for inserting institution-specific documents, policies, and any other information deemed appropriate for the individual organization’s welfare program (in other words, your documents specific to your zoo or aquarium). It is intended to be a living document. As current trends, standards and practices change, so might the zoo or aquarium’s philosophies and welfare program needs.

Standard 1.5.0 requires a process in place to assess the welfare of all animals in a zoo or aquarium’s care. Since most zoos/aquariums have thousands of animals in their care, what’s the best way to begin this large task? How do you prioritize your staff’s time and focus? We suggest seeking advice and suggestions from your animal care staff at the team level -- asking whether there are any animals that may be of particular or potential concern. For those animals that are managed as a group (i.e., such as aquatic animals in large tanks not individually identified or managed), which tanks or habitats are more problematic or challenging from a welfare perspective? With this prioritized list in hand, each team can then create a timeline for the development of specific welfare monitoring.
The AZA Animal Welfare Committee defines animal welfare as an animal’s collective physical, mental, and emotional states over a period of time, and is measured on a continuum from good to poor.

An animal typically experiences good welfare when healthy, comfortable, well-nourished, safe, able to develop and express species-typical relationships, behaviors, and cognitive abilities, and not suffering from unpleasant states such as pain, fear, or distress. Because physical, mental, and emotional states may be dependent on one another and can vary from day to day, it is important to consider these states in combination with one another over time.

There is no single measure of welfare. Welfare can be influenced by a variety of factors and slides on a continuum from poor to excellent based on these different factors. Thus assessing the wellbeing of an animal at any point in time is challenging at best. Today’s zoo and aquarium animal welfare programs strive to be proactive rather than reactive and include health assessments, promote behavioral diversity and animal choice, allow for lifelong care and planning, and incorporate hiring and training of staff with positive attitudes.

The preamble to the 2017 AZA Accreditation Standards states that "AZA zoo and aquarium standards support the premise of five opportunities to thrive”. These tenets are based on Vicino and Miller’s work (Vicino and Miller, 2015). Vicino and Miller describe five opportunities to thrive as:

1. Opportunity for a **well-balanced diet** - fresh water and a suitable, species-specific diet will be provided in a way that ensures full health and vigor, both behaviorally and physically.

2. Opportunity to **self-maintain** - an appropriate environment including shelter and species-specific substrates that encourage opportunities to self-maintain.

3. Opportunity for **optimal health** - providing supportive environments that increase the likelihood of healthy individuals as well as rapid diagnosis and treatment of injury or disease.

4. Opportunity to **express species-specific behavior** - quality spaces and appropriate social groupings will be provided that encourage species-specific behaviors at natural frequencies and of appropriate diversity while meeting social and developmental needs of each species in the collection.

5. Opportunities for **choice and control** - providing conditions in which animals can exercise control and make choices to avoid suffering and distress, and make behavior meaningful.

These tenets complement the five domain model of animal welfare (Mellor and Beausoleil, 2015) used as a framework for the World Association of Zoos and Aquariums (WAZA) welfare strategy (WAZA, 2015). The five domains include:

1. **Nutrition** – the appropriate consumption of nutritious foods is an ongoing pleasurable experience
2. **Environment** – benign conditions offer ongoing comfort and safety  
3. **Physical Health** – ongoing good physical health secures robustness and vitality  
4. **Behavior** – activities involving variety, choice, and benign challenge are rewarding  
5. **Mental or Affective States** – survival-related negative experiences are minimal, and comfort, pleasure, interest and confidence are common positive experiences.

The five opportunities to thrive, combined with the five domains of animal welfare, have been blended to create an animal welfare framework for AZA zoos and aquariums.

---

**Proposed AZA Animal welfare framework**

Zoos and aquariums accredited by the Association of Zoos and Aquariums (AZA) are committed to promoting positive welfare for the animals in their care by focusing on the following components of animal welfare:

1. **Nutrition** – a suitable, species-appropriate diet will be provided in a way that ensures full health and vigor, both behaviorally and physically.
2. **Environment** – animals will experience an appropriate environment that encourages opportunities to self-maintain and promotes ongoing comfort and safety.
3. **Health** – animals will have the opportunity to experience good physical health including access to a wellness program as well as rapid diagnosis and treatment of injury/disease to ensure ongoing robustness and vitality through all life stages.
4. **Behavior** – quality spaces and appropriate social groupings will be provided that encourage species-appropriate behaviors at natural frequencies and of appropriate diversity while meeting social and developmental needs of each species in the collection.
5. **Choice and control** – animals will have an opportunity for choice and control to seek out and achieve a positive welfare state while able to make choices to avoid suffering and distress.
6. **Affective or mental states** - conditions will be provided in which animals will have the opportunity to experience a predominance of positive emotional states and minimize negative survival-related experiences and emotional states.
Developing and maintaining an animal welfare program can be an ambitious task, especially initially determining the overall scope of the program. A mission statement can help define the overall goals of your welfare program and communicate succinctly and efficiently to all staff the ultimate animal welfare objective within the organization. A mission statement can also provide staff with guiding values from which to focus departmental goals, and should state what your animal welfare program will do, how your zoo/aquarium will accomplish this, and your goals and objectives.

A vision can help guide the welfare program for the future and help inspire staff to take welfare programs to a higher level. It can also help in goal setting over the short and long term to ensure that animals have ample opportunities to thrive. Your zoo or aquarium's existing mission and vision statements may be linked to your animal welfare program statements.

Accreditation Standards:

Although no specific standards relate to the need for an institutional animal welfare mission/vision, the general considerations of the first chapter of AZA accreditation standards state that:

“Animal welfare, care, and sustainable population management are among the most critical and complex tasks performed by AZA zoos and aquariums. Administration and management must be guided by modern professional principles establishing plans and procedures to execute those functions.”

1.5.1. All animals must be well cared for and presented in a manner reflecting modern zoological practices in exhibit design, balancing animals’ welfare requirements with aesthetic and educational considerations.

AZA Required Documents: None at this time

☐
☐
☐

Documents to Possibly Include:

☐ Organizational animal welfare vision statement
☐ Organizational animal welfare mission statement
☐
Additional Resources:

☐ WAZA Animal Welfare Strategy

☐ Taronga Zoo Animal Welfare Charter


Just as AZA standards require accredited zoos and aquariums to have a point of contact or committee to drive their organization's enrichment programs, we recommend that each AZA organization identify a specific paid staff member or committee responsible for oversight, implementation, assessment and interdepartmental coordination of animal welfare efforts. One aspect of the Animal Welfare Team might be to oversee the "welfare concern process" required by AZA accreditation standards, but this is unlikely to be the committee's sole focus. Instead, the animal welfare committee should work to proactively enhance the welfare of the animals.

Because animal welfare is multi-faceted, the welfare team for a particular zoo or aquarium should include those versed and experienced in various aspects of animal care. The team might include a staff member dedicated to animal welfare and/or a cross section of the institution's leadership and animal care team. The members of the Animal Welfare Team should have the knowledge and resources to drive the welfare program and meet its goals and objectives. The team might also have the responsibility and authority to make welfare program decisions within the organization. The Animal Welfare Team might include roles such as:

- Director of Animal Welfare or Welfare Biologist/Researcher – coordinate and oversee welfare research and evidence-based evaluations.
- Chief Veterinarian – provide input on physical care, nutrition, end of life decisions.
- Animal Curator(s) – provide input on animal management, priorities, housing and general care.
- Curator of Behavioral Husbandry – plan and oversee animal training and enrichment programs to include behavioral observations and options for animals that allow them to make choices.
- Area keepers – provide input on daily animal care, animal personality, social interactions, housing, daily activity and behavioral changes.
- Nutritionist – monitor and evaluate animal diets to ensure nutrient balance, appropriate variability of food and delivery in a way that maximizes physical wellbeing.
- Horticulturist – assist with browse program to ensure plants provided are safe for animals.
- Scientist – assist with behavioral and/or physiological measures of well-being.
- Managers from other departments such as education, operations, guest services, marketing to ensure that all staff (not just animal care staff) are included and tasked with making welfare a priority.
- External advisors and potential community representatives.

Accreditation Standards

1.5.0. The institution must follow a written process for assessing animal welfare and wellness.
AZA Required Documents: (see animal welfare concern process later in the document)

☐
☐
☐
☐

Documents to Possibly Include:

☐ Job description/role clarification for each team member
☐
☐
☐

Additional Resources:

☐
☐
☐
☐

1.5.8. “The institution must develop a clear process for identifying, communicating, and addressing animal welfare concerns within the institution in a timely manner, and without retribution.”
An animal’s welfare state is based on a combination of factors that affect physical, emotional and behavioral wellbeing. Some of these factors contribute to the animal’s welfare state, whereas others are the measurable effects of those contributing factors.

“Inputs” are the resources, facilities, processes and practices that contribute to the animal’s overall experience. “Outputs” are what the animal actually experiences and should be quantitative, objective measures of welfare evaluated at the level of the individual. Since welfare is a multi-faceted and subjective state, more than one welfare output is usually needed to ensure ease of interpretation and accuracy of welfare assessments. Ideally, all outputs (measures of welfare) should be valid, quantitative measures. However, well-defined, consistently recorded qualitative assessments can also contribute to welfare assessments (e.g., well-constructed keeper checklists).

Inputs are derived from the natural history of the species, individual history, information from animal care manuals, the five opportunities to thrive and best practices. In short, inputs are what "go into" contributing to an animal’s welfare -- the ingredients in a ‘recipe.’ It would be impossible to come up with an all-inclusive list of inputs but some of the more important inputs include (in no particular order):

- Diet/nutrition
- Enrichment (including appropriate choices and challenges)
- Social environment (age, sex, relatedness, number of enclosure mates)
- Veterinary care
- Animal training
- Keeper experience, training and qualifications (also attitude/job satisfaction)
- Keeper turnover or stability in animal areas
- Environment (wind, temperature, sun etc.)
- Potential stressors or frustration-inducing situations
- Physical enclosures (size and complexity)
- Natural history (activity, social system, territory range, diet)
- Individual history (e.g., hand raised/parent raised, young, geriatric)
- Medical history
- Number of transfers

Outputs are derived from the scientific literature and from experience with the species in managed care and in the wild. They can be measured directly or indirectly. Rarely is it sufficient to rely on just one source of information (behavior, for example); ideally physiological variables should be incorporated (e.g. fecal cortisol) as well. Some outputs are essentially retroactive in that they mainly reflect past welfare (e.g., life expectancy, reproduction and some
health parameters). These measures are a valuable source of information about previously unnoticed welfare issues but additionally every attempt should be made to determine welfare status in the present time. Welfare outputs can be measured indirectly through keeper checklists; however, ideally these should be previously scientifically validated. WelfareTrak®, a welfare monitoring program, is an example of this approach. As always, behavior is a sensitive and informative welfare assessment measure. Tools are becoming available to facilitate the collection, analysis and reporting of behavioral data (Zoo-Monitor is an example of such a tool). WelfareTrak®, Zoo-Monitor and analogous tools open up the possibility of continuous or real-time monitoring of welfare through time, a goal that zoos should aspire to. The following is a list of potential welfare output measures:

- Behavior (indicators of good wellbeing, e.g., play, exploration, problem solving, positive social interactions, species appropriate behavior, behavioral diversity; and indicators of poor wellbeing, e.g. stereotypic behavior, fear responses, abnormal and self-injurious behaviors)
- Physiological parameters (e.g., indicators of stress responses such as glucocorticoids, indicators of immune function such as IGA, Cytokines, etc., indicators of proper physiological function, insulin, glucose, leptin, T2 and T3, etc., heart rate, respiration rate, body temperature charts, conductivity (this is a rapidly developing field with an increasing amount of available tools and technology)
- Health (growth rate, body condition, disease, injury, morbidity, appearance and shape of feces and defecation rate)
- Longevity (implicitly a retroactive measure)
- Reproductive success
- Keeper-Animal Relationship (fear/aggression vs. cooperation and trust)
- Keeper based assessments (e.g., validated ranked and relative assessments) from programs such as WelfareTrak®

The Animal Welfare Committee recommends that animal care staff identify and define at least 6-8 input variables that they deem important for the health and welfare of each animal living at their zoo or aquarium and 6-8 output variables (physical, physiological and/or behavioral) that will help to assess welfare in that individual animal. For group housed animals that are not managed individually (e.g., marine fish tanks), we recommend a group approach. A sample form for group managed animals is provided in Appendix C. For species that have been studied using WelfareTrak®, those definitions should be used. For other species, it is important to ensure that each variable is operationally defined and that there is high inter-rater reliability among animal care staff in recording both input and output variables.

Accreditation Standards:

A variety of accreditation standards relate directly to welfare inputs, several of which are provided below. Outputs are less specifically identified in the standards. Some outputs are addressed in standards that relate to health, longevity and reproduction. Until recently there were no accreditation standards that require quantitative measures of behavior and physiological parameters except when they apply directly to a specific health concern. New in the 2018 AZA accreditation standards is standard 1.5.0 which requires the institution to follow a written process for assessing animal welfare and wellness. Thus, in accordance with the new standard, AZA zoos and aquariums will be asked to provide a process for assessing welfare inputs and outputs.
Examples of AZA accreditation standards that assess welfare inputs:

1.4.3. Furnishings to accommodate an array of locomotive and foraging behaviors as well as resting and sleeping (Standards for Elephant Management and Care).

1.4.1.2. 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 (Standards for Elephant Management and Care).

1.5.0. The institution must follow a written process for assessing animal welfare and wellness.

1.6.1. The institution must have a formal written enrichment and training program that promotes species-appropriate behavioral opportunities, and a training program that facilitates husbandry and veterinary procedures where appropriate. (Standards for Elephant Management and Care).

2.6.2. The institution should have a written nutrition program that meets the behavioral and nutritional needs of all species, individuals, and colonies/groups in the institution. Animal diets must be of a quality and quantity suitable for each animal’s nutritional and psychological needs.

10.3.3. All animal enclosures (exhibits, holding areas, hospital, and quarantine/isolation) must be of a size and complexity sufficient to provide for the animal’s physical, social, and psychological well-being; and exhibit enclosures must include provisions for the behavioral enrichment of the animals. AZA housing guidelines outlined in the Animal Care Manuals should be followed.

Standard 2.4.2 is an example of a standard that addresses the welfare output of behavior, but is not quantitative or systematic.

2.4.2. Keepers should be trained to recognize abnormal behavior and clinical signs of illness and have knowledge of the diets, husbandry (including enrichment items and strategies), and restraint procedures required for the animals under their care.

AZA Required Documents:

☐ Ambassador animal policy
☐ Animal Care Manuals (for species housed at your zoo/aquarium)
☐ Elephant management policy (if applicable)
☐

Documents to Possibly Include:

☐ Check list of measurable inputs and outputs for simple welfare assessments
Individual animal history (A list of individual history and individual history questions can be found in Appendix A)
Natural history questionnaire (A list of natural history and individual history questions can be found in Appendix A)

Additional Resources:

- WelfareTrak®, developed by Brookfield Zoo
- Ethotrak®, developed by Brookfield Zoo
- Zoo-Monitor developed by Lincoln Park Zoo
Animal History

Species Natural History & Individual Animal History

Animal welfare is a diverse science, comprised of physical, physiological, behavioral and psychological states. Therefore, investing time and energy into understanding the life and physical parameters of the species in the wild can have a strong positive impact on the individuals' lives in the zoo. For example, prior to implementing an animal training or enrichment program, a review of the species' natural history can provide a strong informational foundation from which to develop behavioral goals and can ultimately lead to effective enrichment brainstorming. The same information can be used to develop physical and physiological health-based goals and nutrition programs, among others. A list of natural history and individual history questions can be found in Appendix A.

Additionally, the background of each animal (e.g., rearing history, temperament and past experiences) plays a role in its present and future welfare. For example, the type of rearing can impact an animal’s personality or behavioral and social interactions. The number of transfers between facilities may also affect the wellbeing of an animal. A transfer may affect the welfare of the focal animal, as well as that of the social group it may have left, or the one it may be joining. An understanding of the social structure of the species and the animals' individual temperaments and behavioral traits can have a significant effect on the overall wellbeing of each animal in consideration. While researching these facts requires a time investment, it is one that certainly pays off in the wellbeing of the animals. Information gained from the individual and natural history can serve as inputs and factors that contribute to the animals' overall experience.

Accreditation Standards:

1.2.1. As available, the institution must review and provide access for all paid and unpaid animal care staff, to all AZA Animal Care Manuals (ACMs) that have been approved and that apply to species at the institution.

AZA Required Documents: None at this time

☐ Animal care manuals for species within the zoo or aquarium’s animal collection
☐
☐
☐

Documents to Possibly Include:

☐ Species natural history questionnaire (A list of natural history and individual history questions can be found in Appendix A)
☐ Individual animal history questionnaire (A list of natural history and individual history questions can be found in Appendix A)
☐ Link to ZIMS/Tracks animal records and history

Additional Resources:

☐ Animal Diversity Web: http://animaldiversity.org/
☐ Ecological Data Wiki: https://ecologicaldata.org/wiki/pantheria
There is general agreement that there is no single measure of welfare. Instead, an animal's welfare is assessed by monitoring multiple relevant indicators. Typically, scientists and animal care staff assess any number of input variables (e.g., husbandry, natural history, individual history, enclosure size, diet, social grouping) that can impact an animal's overall experience; these are sometimes termed resource-based variables. These are the "ingredients" that go into providing an opportunity for an animal to experience good welfare. In addition to inputs, outputs are also assessed. Outputs are health and well-being indicators (animal based) including behavioral (e.g., play behavior, investigation, stereotopy), physical (e.g., fur, feather, scale condition, body weight), and/or physiological (e.g., immune functions, cortisol) assessments. These assessments of inputs and outputs can be accomplished through systematic scientific evaluations (e.g., Razal et al., 2017), qualitatively by experienced animal care staff monitoring both inputs and outputs through daily keeper notes, descriptions, photos/videos, discussion, and work plans (e.g., Whitham and Wielebnowski, 2009; Butterworth et al., 2011), as well as by inspectors during an accreditation or certification process. We encourage animal care staff familiar with the individual animals to be assessed to use the outline below to create a list of germane inputs and outputs relevant to that individual animal. Both inputs and outputs should be carefully defined (in writing), gaining consensus from the group of caretakers on both the lists and the definitions of inputs and outputs. Inter-rater reliability is key to the successful use of this welfare assessment tool (e.g., if fecal form is assessed, all members of the animal care team should score fecal form the same way -- "we all scored this as a '5' on our fecal form scale").

Assessing animal welfare

The proposed welfare framework provided in this template (see Page 5) is a hybridized model that takes into account the “Five Opportunities” model (Vicino and Miller, 2015) and the “Five Domains” model (Mellor and Beausoleil, 2015; WAZA, 2015).

Below is an outline that can be used to compile and define specific inputs and outputs for the animals at your organization. This outline represents a starting point for qualitative assessments of your animals. While this will not create a scientifically valid tool, it does provide a framework for useful and important welfare indicators that can be reliably recorded over time and be used to assess the well-being of the animals in your care. As you describe both the inputs and outputs, it will be important to carefully define and consistently record this information. Your job will be to look for trends over time. Where possible, we aim to assess the welfare of individual animals using both positive and negative indicators. Inevitably, animals will experience stress and possibly distress (e.g., a fight with a conspecific, construction nearby). This tool will allow you to monitor an animal's responses and assure that the animal is not showing long term, chronic indicators of negative welfare and that it is demonstrating indicators of positive welfare. The pages below list potential indicators of welfare, that is, possible inputs and their measurable outputs that help in assessing wellbeing.
You'll see that we have described both inputs (factors that contribute to an animal's welfare, such as habitat, diet, early rearing experience), and outputs. We've listed examples of both positive and negative outputs (indicators of welfare). Not all inputs, and not all outputs are relevant to all species. Your job is to choose the most important inputs and outputs for the individual animals (or individual enclosures or habitats if managed as a group) that you deem most relevant to the animal's welfare.
Welfare assessment component - **Nutrition**

*A suitable, species-appropriate diet will be provided in a way that ensures full health and vigor, both behaviorally and physically.*

**Inputs**
- Animal’s diet is part of an overall nutrition program with access to appropriate nutritional expertise and facilities
- Animal has access to a well-balanced, safe and high-quality dietary components and ingredients
- Mechanisms in place for species-appropriate diet delivery, frequency, and access (e.g., scatter feed vs. bowl, carcass feeding, working for food)
- Presence of dietary variety and choice

**Positive Outputs**
- Appropriate appetite
- Demonstration of species-appropriate feeding behaviors
- Good body condition for age class
- Good conditioning and muscle tone
- Species and individual appropriate weight
- Normal fecal consistency and/or normal elimination frequency
- Evidence of dietary variety and choice
- Lack of nutrition-related health issues
- Good fur, skin, feather, scale health

**Negative Outputs**
- Reduced or absent appetite
- Absence of species-appropriate feeding behaviors
- Poor body condition/emaciation/obesity
- Over-conditioning or under-conditioning, poor muscle tone
- Abnormal fecal consistency and/or elimination frequency
- Evidence of nutrition-related health issues (e.g., iron storage disease, gastroenteritis)
- Inability to consume species-appropriate diet
- Lack of dietary variety or choice

**2017 Accreditation standards for nutrition-related inputs:** Nutrition. 2.6.1 – 2.6.4

Questions to assess nutrition-related welfare outputs

1. What is the overall body condition of the animal(s) in this exhibit/space/tank?
2. Is there a body condition score (BCS) system for this species? If so, what is the score for this animal/group?
3. Does the animal look emaciated, well-conditioned, under-conditioned, over-conditioned, or obese?
4. What is the fecal quality (e.g., loose to constipated) and frequency of output for this animal?
5. How often is the diet varied for this animal?
6. Can you describe the diversity of ways in which the diet is presented and how the animal reacts to that diversity?
7. Is the diet presented in such a way to encourage species-typical feeding patterns i.e. how wild counterparts feed?
8. Have you observed challenges with nutrition-related health issues such as vitamin/mineral deficiency or excess, loss of condition, obesity, plant/browse toxicity, trauma from feeding aggression, etc.?

Most outputs are not black and white, good or bad, but instead exist along a range. For example, body condition score (BCS) is often rated on a scale from 1-9 with 1 being emaciated and 9 indicating obesity. With this welfare assessment (output), the animal care team's job is to carefully define each number in the body condition score scale, demonstrate inter-rater reliability and monitor the animal using this scale. The ideal for body condition is typically a 5 (midpoint along the scale). Body condition scoring has not been scientifically validated in most species so this will be a qualitative measure for you and your team to use. Validation of this scale could include comparing BCS to weight and to assessments during physical exams.
Welfare assessment component - **Environment**

*Animals will experience an appropriate environment that encourages opportunities to self-maintain and promotes ongoing comfort and safety.*

**Inputs**
- Animal has access to environmental components that allow species-appropriate behaviors (climbing, digging, flying, swimming, etc.)
- Animal is in an environment/spaces that is safe/secure
- Animal is provided with appropriate ambient conditions (climate, temperature, noise, light and vibration)
- Animal has appropriate substrate for normal health and function
- Animal has access to appropriate refuge or shelter
- Opportunities for access to spaces for sufficient sleep/rest during the 24 hour period
- Access to appropriate environmental elements (e.g., sunlight, UVB, pH, salinity)
- Animal receives appropriate environmental enrichment as part of a structured enrichment program
- Animal is cared for by qualified and trained animal care personnel

**Positive Outputs**
1. Evidence of diverse use of the environment/spaces to demonstrate species-appropriate behaviors
2. Exhibit species-appropriate use of refuge
3. Exhibit species-typical sleep/rest pattern
4. Demonstrated ability to exhibit choice and control in a variety of environmental situations
5. Absence of compensatory environmental behavior (i.e. shivering, chilling, panting, or overheating)
6. Absence of environmental related health issues

**Negative Outputs**
- Lack of diverse use of space/environment
- Lack of access to or use of refuge
- Lack of choice or control to avoid negative environmental conditions/stimuli (heat, cold, precipitation, noise, etc.)
- Exposure to extremes of heat/cold as evidenced by common sense or observation of compensatory behaviors such as shivering, chilling, panting, or overheating
- Evidence of environment related health issues
- Presence of inappropriate, noxious or uncomfortable ambient environmental conditions (climate, temp, noise, light, and vibration)
2017 Accreditation standards for environment-related inputs: Animal welfare and well-being. 1.5.1-1.5.2, 1.5.6, 1.5.9-1.5.10, 1.5.14-1.5.16. Enrichment and husbandry training. 1.6.1-1.6.4. Animal care manuals. 1.2.1-1.2.2. Staff. 7.3, 7.5, 7.8, 7.10

Questions to assess environment-related welfare outputs

1. Does this animal use a wide variety of different locations within the exhibit/space/tank?
2. Can you describe the use of environmental features in this exhibit/space/tank that relate to species-appropriate behaviors (i.e. arboreal primates using climbing structures, reptile using basking areas, fish utilizing tank features or the water column as expected for the species?)
3. Have there been any events (concerts, construction, weather, social changes, keeper changes, other) that resulted in unusual behaviors in this animal?
4. Are the ambient environmental conditions appropriate for this species or individual?
5. Are there features of the environment that could be considered disruptive, noxious, or stressful (i.e., excessive noise, intrusive lighting, vibration, emissions, etc.)?

Most outputs are not black and white, good or bad, but instead exist along a range. For example, sleeping pattern could range from sleeping too little to sleeping too much with typical being your team's determination of optimal. With this welfare assessment (output), the animal care team's job is to carefully define the range of each animal's sleep pattern using knowledge of the animal's natural history and individual history, demonstrate interrater reliability and monitor the animal using this scale.
Welfare assessment component – Health

Animals will have the opportunity to experience good physical health including access to a wellness program as well as rapid diagnosis and treatment of injury/disease to ensure ongoing robustness and vitality through all life stages.

Inputs
- Animal is part of an overall health program with access to appropriate medical expertise, policies, procedures, equipment and facilities
- Animal is part of a preventive health and wellness program
- Animal is part of a program that provides rapid diagnosis and treatment of pain, injury or disease

Positive Outputs
- Evidence of overall positive health
- Evidence of prompt management of pain, injury or disease
- Species appropriate disease prevalence
- Ability to demonstrate pain-free normal movement, ambulation, righting reflex
- Normal fecal consistency, urination, and voiding behavior
- Well-groomed or preened body surfaces, vibrant coloration
- Normal physiologic parameters
- Reproductive success as desired
- Normal activity level

Negative Outputs
- Unmanaged or uncontrolled pain, injury, or disease
- Abnormal patterns or trends of disease
- Lack of mobility, inability to ambulate, lack of righting reflex
- Lack of fecal or urine control; abnormal stool consistency
- Non-intact body surfaces; loss of skin, scales, feathers
- Altered physical or physiological indicators of health
- Lack of reproductive success when reproduction is desired
- Abnormal activity level; apathetic, lethargic, sleeps and/or hides a lot in a way that is inappropriate for the species

2017 Accreditation standards for health-related inputs: Veterinary Care. 2.1 – 2.5, 2.7, 2.9. Records. 1.4.7

Questions to assess health-related welfare outputs

1. Does the animal appear healthy?
2. Does the animal exhibit normal pain-free activities of daily life such as eating, drinking, controlled urination and defecation, righting response, locomotion and grooming?
3. What were the results of the animal’s most recent preventive health/wellness examination?
4. Have there been any significant or unusual disease incidents or trends in this animal or species at this institution?
5. Does this animal experience a chronic medical condition that must be managed through pharmaceutical or other therapies?

Most outputs are not black and white, good or bad, but instead exist along a range. For example, fecal form could range from liquid diarrhea to a constipated stool with typical being a formed bolus. With this welfare assessment (output), the animal care team’s job is to carefully define each number in the fecal form score scale (ideally use photos as part of the scale; e.g. see the cheetah example in Appendix B), demonstrate inter-rater reliability, and monitor the animal using this scale. -see under “nutrition” for body condition info.
Welfare assessment component - **Behavior**

Quality spaces and appropriate social groupings will be provided that encourage species-appropriate behaviors at natural frequencies and of appropriate diversity while meeting social and developmental needs of each species in the collection.

**Inputs**
- Animal has access to environmental components that allow diverse species-specific behaviors (climbing, digging, flying, swimming, etc.)
- Animal is part of a behavioral training and enrichment program with appropriate expertise and documentation
- Animal is housed in species-appropriate social groupings that encourage species-specific behaviors

**Positive Outputs**
1. Evidence of a diversity of species-appropriate behaviors and age-appropriate behaviors (see Appendix A for examples of natural & individual history questions)
2. Absence of or minimization of stereotypic behavior
3. Well-groomed and preened body surface, vibrant coloration, good coat, feather or scale condition
4. Social interaction and breeding as appropriate
5. Species-typical sleep/rest pattern/behavior
6. Appropriate reaction to environmental stimuli or change
7. Participation in training programs or use of environmental enrichment to demonstrate species-specific behaviors

**Negative Outputs**
- Evidence of abnormal behaviors (e.g., repetitive behaviors)
- Low levels or absence of species-appropriate behavioral diversity
- Evidence of inadequate grooming, preening, hygiene
- Lack of social interaction as appropriate to the species
- Limitations on sleep/rest
- Apathy or inability to react to environmental stimuli or change
- Lack of participation in or use of environmental enrichment or training program

**2017 Accreditation standards for environment-related inputs:** Animal welfare and well-being. 1.5.1-1.5.2, 1.5.6. Enrichment and training. 1.61.

Questions to assess behavior-related welfare outputs

1. What are the types of behaviors you would expect to see in this species? Are those behaviors observed? If so, how frequently?
2. What unique set of behaviors are indicative of good welfare in that individual animal? What unique set of behaviors are indicative of poor welfare in that individual animal?
3. Is repetitive or stereotypic behavior observed? How frequently? Under what circumstances? If observed, what is done to mitigate the behavior and does that work? What are the presumed motivators that seem to trigger this behavior?
4. Is escape/avoidance behavior observed? If so, how frequently? Under what circumstance(s)? What is done to mitigate the behavior and is the solution effective?
Welfare assessment component – **Choice and control**

**Animals will have an opportunity for choice and control to seek out and achieve a positive welfare state while able to make choices to avoid suffering and distress.**

The concept of choice and control can apply to almost any welfare component, but is most prevalent when examining environmental and behavioral inputs and outputs. Inputs should be designed or provided to allow animals to choose environments or behaviors that promote a positive welfare state while also providing freedom for an animal to avoid or escape negative welfare states.

**Inputs**
- The concept of choice and control can apply to almost any welfare component, but is most prevalent when examining the environmental and behavioral inputs and outputs.

**Positive Outputs**
- When frightened, the animal can hide
- When cold, can seek warmth
- When threatened, can escape or seek refuge
- When fatigued, can rest/sleep
- When not desiring to participate in programs or exhibition, can choose not to participate
- Can seek out social interactions as appropriate
- Can find and participate in cognitive challenges
- Can find opportunities to explore/innovate

**Negative Outputs**
- Does not have opportunities to hide when frightened
- Does not have options to thermoregulate
- Does not have options to seek refuge
- Does not have options to sleep/rest without excessive disruption
- Has no choice in whether it participates on a program
- Has little to no choice about seeking/avoiding social interactions
- Has no choice in accessing holding area
- Has little to no cognitive challenges
- Has little to no opportunities to explore/innovate

**2017 Accreditation standards for choice and control-related inputs:** Animal welfare, care and well-being. 1.5.4. Facilities. 1.4.4. Behavior management. 4.3. Environment: 7.2.4.

Questions to assess choice and control-related welfare outputs

1. What unique set of behaviors are indicative of good welfare in that individual animal?
2. What unique set of behaviors are indicative of poor welfare in that individual animal?
3. How does the individual utilize the space within its environment? Does it make use of all areas? Go inside or out when doors are open?
4. How does the animal utilize objects within its environment?
5. Does the animal interact with enclosure mates? If so, in what manner?
6. How does the animal respond to training sessions?
Welfare assessment component – Affective or mental states

Conditions will be provided in which animals will have the opportunity to experience a predominance of positive emotional states and minimize negative survival-related experiences and emotional states.

Affective or mental states – the concept of affective or mental states (hereafter referred to as affective states) in animals is the concept that animals have the ability to express positive and negative “states” as a consequence of positive or negative experiences associated with the 4 physical/functional domains (nutrition, health, environment, behavior). The concept of affective states is relatively new to its broad application across taxa. Objective evaluation of states such as fear, comfort, distress, or curiosity have been documented in an ever increasing number of taxa. There is good evidence from the neuroscience field that regions of the brain responsible for affective states are highly conserved among a wide variety of vertebrate species from all taxa including fish, reptiles, amphibians, birds and mammals. Neurophysiologist Jaak Panksepp mapped and identified the neural basis for seven basic emotions in rats (2011); Panksepp made a strong case for these same emotions (fear, rage, panic, lust, seeking, care, and play) existing in all mammalian species and paved the way for the notion that animals have emotions and feelings similar to humans.

Inputs
- Inputs from any of the four physical domains (nutrition, health, environment, or behavior) can impact the affective state of an animal.

Positive Outputs
- Satiety
- Pleasure of taste
- Comfort
- Reward
- Excitation
- Playfulness
- Curiosity
- Contentment
- Calmness
- Affection

Negative Outputs
- Thirst
- Hunger
- Pain
- Fear
- Breathlessness
- Distress
- Boredom
- Frustration
- Anger
- Malaise
- Apathy
- Anxiety

2017 Accreditation standards for health-related inputs: Animal welfare and well-being.
1.5.2.2

Questions to assess health-related welfare outputs

1. Does the animal appear to show more signs of positive versus negative affective states?
2. Does the animal have access to and partake in species-appropriate social interactions/choices?
3. Does the animal have a good/positive trust relationship with its keepers?
4. Can the animal fulfill its need to perform species-appropriate and highly motivated behaviors?
5. Are the animal’s relationships and social interactions and temperament considered when animal transfers are planned?
The Association of Zoos and Aquariums supports the appropriate use of ambassador animals as an important and powerful educational tool that provides a variety of benefits to zoo and aquarium educators seeking to convey cognitive and effective messages about conservation, wildlife and animal welfare. The use of ambassador animals has been demonstrated to result in lengthened learning periods, increased knowledge acquisition and retention, enhanced environmental attitudes and the creation of positive perceptions concerning zoo and aquarium animals (see Sherwood, 1989; Knapp and Benton, 2005; Povey and Rios, 2005 for examples). Visitors to demonstrations with live animals have shown to be able to answer questions correctly at a rate as much as eleven times higher than visitors to the exhibits (Heinrich and Birney, 1992).

That said, animal care staff and zoo and aquarium visitors have questions regarding the welfare of zoo animals and want to know that they receive excellent, personalized care. As zoo and aquarium professionals, it is our responsibility to ensure that every animal receives species-appropriate habitats, social interactions, enrichment and diet, regardless of their role within the organization. Ensuring quality of life for ambassador animals involves evaluating time spent outside of programs as much so as their time as ambassadors in front of guests. Providing ambassador animals with options to choose among a variety of conditions within their environment is essential to ensuring effective care, welfare and management. Some of these requirements can be met outside of the primary exhibit enclosure while the animal is involved in a program or is being transported.

The Animal Welfare Committee recommends that animal care staff identify and define 6-8 input variables that they deem important for the health and welfare of each ambassador animal and 6-8 output variables (physical, physiological and/or behavioral) that assess welfare in that individual animal. Assessments should include measures of welfare in their home enclosures as well as during demonstrations and a method for assessing an animal's choice or willingness to participate in a demonstration.

Accreditation Standards:

<table>
<thead>
<tr>
<th>1.5.0.</th>
<th>The institution must follow a written process for assessing animal welfare and wellness.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5.2.</td>
<td>All animals must be housed in enclosures and in appropriate groupings which meet their physical, psychological, and social needs. Wherever possible and appropriate, animals should be provided the opportunity to choose among a variety of conditions within their environment. Display of single animals should be avoided unless biologically correct for the species.</td>
</tr>
<tr>
<td>1.5.4.</td>
<td>If ambassador animals are used, a written policy on the use of live animals in programs must be followed and incorporate the elements contained in AZA’s “Recommendations For Developing an Institutional Ambassador Animal Policy” (see pages 74 - 79). An education,</td>
</tr>
</tbody>
</table>
conservation, and welfare message must be an integral component of all programs. Animals in education programs must be maintained and cared for by paid and/or unpaid trained staff and housing conditions must meet standards required for the remainder of the animals in the institution. While outside their primary enclosure, although the conditions may be different, animal safety and welfare need to be assured at all times.

1.5.5. For animals used in offsite programs and for educational purposes, the institution must have adequate protocols in place to protect the rest of the animals at the institution from exposure to infectious agents.

AZA Required Documents:

☐ Institutional Ambassador Animal Policy
☐ Protocols to ensure animals used off site cannot transmit diseases to other resident animals.
☐
☐

Documents to Possibly Include:

☐ Tracking of program animal handling times and exposure
☐ Natural history questionnaire
☐
☐

Additional Resources:

☐ AZA Ambassador Animal Policy (pg. 69 of 2017 Accreditation Standards)
☐ AZA Ambassador Animal Position Statement (pg. 71 of 2017 Accreditation Standards)
☐ AZA Welfare considerations for Ambassador Animals
  ☐ https://www.aza.org/rc-ambassador-animal-policy
  ☐ https://www.aza.org/rc-animal-handling-training-protocol
  ☐ https://www.aza.org/rc-operations-protocol-for-touch-poolpetting-environment
☐ Sample animal handling guidelines https://www.aza.org/rc-animal-handling-training-protocol
☐ Bitgood, Stephen, Donald Patterson, and Arlene Benefield. Understanding your visitors: ten factors that influence visitor behavior. Jacksonville State University, Psychology Institute, 1986.
☐ Povey, K.D. & Rios, J. (2002). *Using interpretive animals to deliver affective messages in zoos*. Journal of Interpretation Research.
☐ Povey, K. AZA Ambassador Animal Handbook – in development
☐ PARIS (Program Animal Rating and Information System) tool provided by the Philadelphia Zoo and AZA to share information about species used as program/ambassador animals: [https://zooparis.wikispaces.com](https://zooparis.wikispaces.com)
Welfare considerations for zoo and aquarium animals may include the feeding of live animals either as a nutritional consideration or as part of an enrichment program. As animals in the wild spend a considerable amount of time searching for food, enrichment programs for zoo and aquarium animals often focus on food-based activities.

Feeder animals in zoos and aquariums may belong to a variety of taxa, including invertebrates, fishes, reptiles, amphibians, poultry, and rodents. As we learn more about the cognitive capabilities of different species, we know that many can experience pain, discomfort, and stress. Therefore, feeder animals should experience the same quality of care during their lifespan and up to the time of death, as any other resident animal. Housing should allow for a choice of locations to spend their time, the ability to retreat from enclosure mates, enrichment activities, ability to build nests or dens and the ability to exercise and perform normal species movements and activities. Euthanasia procedures should follow those of other animals in the zoo or aquarium to ensure the best quality of life during the animals’ lives. Animals that may be fed out live, should be monitored to ensure a quick death and that they do not suffer at the hands of the predator to which they are being fed.

In September 2017, AZA approved the AZA Nutrition Scientific Advisory Group’s Guidelines for the Humane and Ethical Acquisition and Management of Vertebrate Feeder Animals (Excluding Fish). This document stresses the importance of providing feeder animals with the same considerations for their wellbeing as for all other zoo and aquarium resident animals and provides a framework within which to do so. This document should be consulted when acquiring and housing live food animals to ensure their good welfare.

Accreditation Standards:

2.9.1. The institution must follow a written euthanasia policy which adheres to the current AVMA Guidelines for the Euthanasia of Animals, or the AAZV Guidelines for the Euthanasia of Nondomestic Animals.

AZA Required Documents:

☐ Euthanasia policy
☐
☐
☐

Documents to Possibly Include:

☐ Policy for the care, enrichment and euthanasia protocols for feeder animals (including fish, rodents, reptiles/amphibians, poultry and invertebrates)
☐ Enrichment and housing plan for feeder animals
☐
☐

Additional Resources:

☐ AZA Guidelines for the Humane and Ethical Acquisition and Management of Vertebrate Feeder Animals (Excluding Fish): www.aza.org/assets/2332/humane_management_of_vertebrate_feeder_animals.pdf
Animal enrichment and training are important and required components of animal care at all AZA accredited zoos and aquariums. The contribution of enrichment and training to the well-being of all taxa has been well documented and programs have been continuously improving, further enhancing the welfare potential for the animals in our care.

Contemporary animal care professionals use positive reinforcement to fluidly shift animals on and off exhibit, teach animals to willingly participate in husbandry and medical behaviors, and perform species-appropriate behavior in educational interpretive programs. Staff should take every opportunity to use positive reinforcement to teach new behavior and replace problem behavior with desirable behavior. By doing so, we give animals more choice of activities within their day and thus control over how they spend their time, and are able to reduce aversive interactions and improve the welfare of the animals in our care. The training program should be based on the natural history of the species while also taking into account the personality and history of the individual animal. Training programs should include goal setting, planning, documentation and evaluation of progress. The program should be evaluated periodically and adjustments made where necessary to ensure continued progress and success.

Accreditation Standards:

1.6.4. The institution should follow a formal written animal training program that facilitates husbandry, science, and veterinary procedures and enhances the overall health and well-being of the animals.

3.3.2.5. All elephants must be trained to reliably present the 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. See most current version of AZA Accreditation Standards for details (https://www.aza.org/assets/2332/aza-accreditation-standards.pdf)

3.3.2.7. 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. See most current version of AZA Accreditation Standards for details (https://www.aza.org/assets/2332/aza-accreditation-standards.pdf)

AZA Required Documents:

☐ Formal written animal training program
☐
☐
☐

Documents to Possibly Include:

☐ Training plan template
☐ Job description of training program coordinator
☐ Training record templates
☐

Additional Resources:

☐ Honing a Sharper Edge on Training: Clarified Principles, Refined Procedures, and Ethical Criteria Workshop at AZA National and Midyear Conferences
☐ AZA Behavior Scientific Advisory Group: https://www.aza.org/behavior-scientific-advisory-group
☐ Disney’s Animal Kingdom animal training: www.animaltraining.org
☐ AZA professional development courses:
  ☐ Animal Training Applications in Zoo & Aquarium Settings
  ☐ Managing Animal Enrichment & Training Programs
  ☐ Principals of Program Animal Management
  ☐ Principals of Elephant Management

☐ AZA learning partners:
  ☐ Animal Behavior Management Alliance: www.theabma.org
  ☐ International Association of Avian Trainers and Educators: www.iaate.org
  ☐ International Marine Animal Trainers’ Association: www.imata.org
  ☐ Natural Encounters, Inc.: www.naturalencounters.com
Enrichment comes in many forms, from the structural environment, to human-animal interactions. Enrichment can be incorporated into habitats or may be “add-ons” that encourage specific activities and interactions. AZA defines enrichment as “a dynamic process in which changes to the structures and husbandry practices are made with the goal of increasing behavioral choices available to animals and drawing out their species-appropriate behaviors and abilities, thus enhancing animal welfare” (AZA/BAG 1999).

Animals should be housed in environments that are complex and offer a multitude of options throughout the day and night. In addition to enriching environments, animals should be offered a variety of activities throughout the day that encourage species-appropriate behaviors and allow them to exercise control over various elements of their lives. Enrichment programs should begin with a thorough understanding of the natural history of the species from which behavioral goals can be determined. Goals should be well planned to ensure that enrichment is offered throughout the 24-hour period and that there is an ample amount of enrichment items and variety of activities to enhance the wellbeing of each animal within an enclosure. The effectiveness of enrichment should be evaluated on a regular basis to ensure that items and activities offered do indeed meet the behavioral goals.

Planning of enrichment should also include consideration of safety practices. Numerous documents and resources exist that highlight safety concerns that might accompany the provision of enrichment. Considerations for the potential of entanglement, ingestion, impaction, impalement and toxicity are just some concerns that accompany enrichment provision. When developing an enrichment program, the potential benefit of each item should be weighed against the risk potential and modifications made to ensure the highest level of safety.

Accreditation Standards:

1.6.1. The institution must have a formal written enrichment and training program that promotes species-appropriate behavioral opportunities, and a training program that facilitates husbandry and veterinary procedures where appropriate.

1.6.2. The institution must have a specific staff member(s) or committee assigned for enrichment program oversight, implementation, training, and interdepartmental coordination of enrichment efforts.

2.6.3. The institution should assign at least one person to oversee appropriate browse material for the animals.
AZA Required Documents:

☐ Formal written enrichment program that promotes species-appropriate behavioral opportunities
☐ Written environmental enrichment plan for elephants (if applicable) showing evidence of implementation
☐ Job description for enrichment program coordinator

Documents to Possibly Include:

☐ Institutional enrichment approval form template
☐ Institutional enrichment evaluation form template
☐ Institutional approved enrichment list
☐ Safety considerations and protocols for enrichment

Additional Resources:

☐ AZA Behavior Advisory Group: www.aza.org/behavior-scientific-advisory-group
☐ Sample enrichment program frameworks: https://www.aza.org/rc-animal-enrichment-training-program
☐ Honolulu Zoo enrichment ideas: http://www.honoluluzoo.org/support-the-zoo/environmental-enrichment-program.html
☐ Disney’s Animal Kingdom enrichment program: www.animalenrichment.org
Welfare Considerations for Care and Treatment

Medical care and treatment of animals in AZA institutions is a pivotal component of animal welfare. When considering the best possible animal welfare in relationship to medical care, each institution should consider staffing (both skilled animal and veterinarian), pharmaceuticals, equipment, preventive medicine, necropsy, nutrition, quarantine, pest control and general policies, all of which are part of existing AZA protocols.

A fundamental tenet of animal welfare is the opportunity to thrive, much of which falls under the umbrella of animal health. Well designed and implemented programs in preventive medicine eliminate or minimize many disease risks for the target species of animals and potentially other similar species (i.e., reduction of infectious disease). Expert clinical medical care is also critical to good animal welfare, providing treatment and supportive care to ill or injured animals to improve or preserve their lives and to allow them to engage in normal behaviors and appropriate social groups. Preventive and clinical medicine encompasses all aspects of anesthesia, capture, diagnostic procedures, surgical procedures, appropriate treatments and medications and postmortem examination. Quarantine is also part of a preventive medicine program. AZA has established quarantine standards for member institutions. However it is important for the veterinarian in charge of quarantine to consider animal welfare factors for individual animals. By using judicious risk assessment, variances may be made in some cases, such as reducing the length of quarantine or the level of isolation to accommodate nervous or social animals.

The attending veterinarian must be familiar with the collection beyond the provision of medical care. Veterinarians should be familiar with management practices and should interact with keeper and curator staffs regularly. Veterinarians may be able to correlate health concerns with stress or behavior changes that might indicate underlying welfare concerns. Veterinarians should also be included in the development and implementation of training plans for medical behaviors. Many veterinary procedures have been greatly enhanced by the use of operant conditioning.

The veterinarians’ role in enrichment programs is also multifaceted. Each enrichment item should be evaluated for safety, often by the veterinarian. However, veterinarians may also be able to help interpret behaviors or identify stress related issues that may benefit from enrichment programs. The opportunity to perform species-typical behaviors is a fundamental feature of welfare.

Quality of life evaluations and end of life decisions are important considerations that must involve animal health professionals in conjunction with other animal care staff. High quality geriatric medicine is an important feature to good welfare for animals in human care. Through regular examinations and consultation with caregivers, veterinarians can diagnose and treat
age-related health concerns such as arthritis, cardiac disease, vision deficits and renal compromise. Alleviating the discomfort and distress associated with these conditions allows animals to continue in normal social settings and perform species-typical behaviors. It is often necessary to make difficult end of life decisions and elect humane euthanasia when an adequate quality of life cannot be maintained. Veterinary professionals must contribute to those decisions as they are trained to objectively assess animal health. Veterinarians will also perform euthanasia in a humane and distress-free manner as possible.

All AZA zoos and aquariums should consider a quality of life evaluation form that includes how assessments are made, who conducts those assessments and how end of life decisions are made. That plan should be developed by a cross section of staff (consider your Animal Welfare Committee/team) and communicated to all staff and volunteers.

Accreditation Standards:

General Considerations:

The institution should adopt the Guidelines for Zoo and Aquarium Veterinary Medical Programs and Veterinary Hospitals, and policies developed or supported by the American Association of Zoo Veterinarians (AAZV). The most recent edition of the medical programs and hospitals booklet is available at http://www.aazv.org/displaycommon.cfm?an=1&subarticlenbr=839, under “Publications”, and can also be obtained in PDF format by contacting AZA staff.

Staff

2.1.1. A full-time staff veterinarian is recommended. In cases where such is not practical, a consulting/part-time veterinarian must be under written contract to make at least twice monthly inspections of the animals and to respond as soon as possible to any emergencies.

2.1.2. So that indications of disease, injury, or stress may be dealt with promptly, veterinary coverage must be available to the animals 24 hours a day, 7 days a week.

Pharmaceutical

2.2.1. Written, formal procedures must be available to the animal care staff for the use of animal drugs for veterinary purposes, and appropriate security of the drugs must be provided.

2.2.2. The use of drugs in aquariums or aquatic exhibits must comply with FDA Guidelines.

Equipment

2.3.1. Capture equipment must be in good working order and available to authorized, trained personnel at all times.

2.3.2. Institution facilities should have radiographic equipment or have access to radiographic services.

Preventive Medicine

2.4.1. The veterinary care program must emphasize disease prevention.
Necropsy

2.5.1. Deceased animals should be necropsied to determine the cause of death. Cadavers must be stored in a dedicated storage area. Disposal after necropsy must be done in accordance with local/federal laws.

2.7. Quarantine

2.7.1. The institution must have holding facilities or procedures for the quarantine of newly arrived animals and isolation facilities or procedures for the treatment of sick/injured animals.

General Policy and Practice

2.9.1. The institution must have a written euthanasia policy which follows the current AVMA Guidelines for the Euthanasia of Animals, or the AAZV Guidelines for the Euthanasia of Nondomestic Animals.

AZA Required Documents:

☐ Euthanasia policy
☐ Quarantine policy
☐ Written procedures for use of drugs for veterinary purposes

Documents to Possibly Include:

☐ End of Life process including who makes what decisions
☐
☐
☐

Additional Resources:

☐ American Association of Zoo Veterinarians: www.aazv.org
☐ Sample preventive animal medicine protocol: www.aza.org/rc-preventative-animal-medicine-protocol
☐ Sample quarantine procedures: www.aza.org/rc-quarantine-procedures
☐ Sample protocol for use of controlled drugs: www.aza.org/rc-written-protocol-for-controlled-drugs
☐ End of Life Workshop provided at AZA, AAZK, and AAZV by Disney's Animal Kingdom staff.
Animals residing in zoos and aquariums should be fed a complete and balanced diet and their diets reviewed periodically. Animals should not only received balanced diets, but those diets should also encourage natural feeding responses and behaviors.

With a knowledge of the animal's natural history, it is a challenge to the animal care, veterinary and nutrition staffs to provide diets in such a way as to encourage species-typical behavior. This is movement away from diced up diets served in silver bowls.

Browse provides not only nutrition but for many animals (terrestrial and aquatic) also provides enrichment. The first consideration is determining that the browse is safe for the animal, and once safe sources have been determined, enhancing enrichment programs by expanding the number of animals receive browse and how often browse is offered.

AZA Standards

2.6.2. The institution must follow a written nutrition program that meets the behavioral and nutritional needs of all species, individuals, and colonies/groups in the institution. Animal diets must be of a quality and quantity suitable for each animal's nutritional and psychological needs.

2.6.3. The institution should assign at least one paid or unpaid staff member to oversee appropriate browse material for the animals (including aquatic animals).

AZA Required Documents:

- Institutional nutrition program
- Job description of browse program coordinator
- 
- 

Documents to Possibly Include:

- Enhanced existing nutrition plan to include methods for encouraging species appropriate feeding behavior.
- 
- 

Additional Resources:
☐ AZA Nutrition Advisory Group: www.nagonline.net
☐ Sample browse programs: www.aza.org/browse-program
☐ 
☐
Lifelong or “cradle to grave” care is a concept drawn from the human health care profession. It acknowledges that health and welfare at any one time is a product of past and present events, stimuli and experiences. Thus, each animal that comes into a zoo or aquarium, whether born or hatched in that facility or transferred in, should have an associated plan to ensure opportunities to express normal species-appropriate behavior and experience good welfare throughout each stage of its life. For example, juvenile animals that are reared in inappropriate social environments may fail to thrive for their entire lives. Certain short term events (e.g., quarantine or veterinary treatment) may also have profound and long lasting effects. More prosaically, an animal that is held in sub-optimal holding areas for part of the 24-hour cycle (at night for example) may not be able to fully benefit from more enriched environments provided at other times.

Lifelong care is a concept that also acknowledges that optimal overall lifetime welfare may be consequent upon periods of reduced welfare. For example, an animal engaged in an intensive veterinary procedure may have significantly reduced welfare for the duration and recovery period of the treatment but as a result of the treatment may have greatly enhanced welfare going forward with an overall welfare benefit.

As part of the collection and animal welfare planning process we recommend considering questions and answers that assess lifelong care. Those questions should include:

- Describe each animal's environment over a 24-hour period. How much time does the animal spend on exhibit? In holding? Alone?
- Describe each animal's environment over a one year period. How much time does the animal spend indoors? In holding? Outdoors? Do the animal's winter quarters meet the animal's biological and psychological needs? For ambassador animals, what percentage of its time is spent in demonstrations? In holding? Do holding facilities provide for the animal's biological and psychological needs?
- Describe the type of care an animal receives over its lifetime. What accommodations can be/are made for young animals? Geriatric animals? Adults with offspring? Individuals who cannot be with conspecifics?
- Describe the care an animal receives in quarantine. Are the animal's biological and psychological needs being met? Can the animal remove itself from fearful situations? Does the animal really need to go through an extended quarantine?

End of life care is intrinsic to lifelong care; limitations associated with age may necessitate different standards and types of care. Euthanasia is an important aspect of lifelong care and each organization will need to have clear, written policies to guide its decisions for the mutual benefit of staff and the animals in their care. Written guidelines should include: who makes the decision, how the decision is made, and how the euthanasia occurrence will be communicated to staff, volunteers and the public.
Accreditation Standards:

1.3.2. The institution must have a written policy on responsible population management that, at minimum, incorporates all requirements contained in AZA’s Policy on Responsible Population Management [AZA’s “RPM Policy”]. (See pages 81 – 88 of these standards for further information (https://www.aza.org/assets/2332/aza-accreditation-standards.pdf)).

1.5.0. The institution must follow a written process for assessing animal welfare and wellness.

2.9.1. The institution must have a written euthanasia policy which follows the current AVMA Guidelines for the Euthanasia of Animals, or the AAZV Guidelines for the Euthanasia of Nondomestic Animals.

AZA Required Documents:

☐ Institutional collection plan
☐ Euthanasia policy - written guidelines for making end of life decisions for animals under its care including: who makes the decision, how the decision is made, and how the euthanasia occurrence will be communicated to staff, volunteers, and the public.
☐ Population management policy
☐

Documents to Possibly Include:

☐ End of Life process including who makes what decisions
☐
☐
☐

Additional Resources:

☐ Disney’s Animal Kingdom Toolkit for End of Life Discussions for Geriatric Animals
☐ Oregon Zoo quality of life evaluation tool.
☐ Smithsonian’s National Zoo Criteria for Assessing Quality of Life for an Animal prior to an Elective Euthanasia Decision.
The AZA defines euthanasia as a “humane death.” Euthanasia is an important tool in the management of animals in human care and can be used as a population management tool or (more commonly) to relieve pain and suffering associated with illness or injury. In the context of relieving pain and suffering, euthanasia could be considered the most important welfare decision made during the life of an animal. For every species in every circumstance, euthanasia should be performed by qualified individuals in accordance with best practices to minimize stress and pain to the individual animal. References are available to assist with proper techniques for humane euthanasia in a wide variety of animals.

The decision to euthanize an animal can be very difficult from both a technical care and a human emotional perspective. Technically, there are few objective criteria that definitively indicate an animal’s welfare has reached a point where death is preferable to life. Emotionally, this lack of objective criteria combined with the natural diversity of human emotions, opinions and philosophies can make the decision to euthanize an animal difficult and sometimes even contentious amongst the zoo and aquarium staff. The human emotional factor in dealing with euthanasia (both the decision itself and the aftermath of the decision) cannot be discounted, but ultimately the welfare of the individual animal must be the priority.

A number of zoos have recognized the challenges associated with euthanasia decisions and have developed processes to assist with their decision-making. Many of these processes attempt to define objective measurements of “quality of life”. It is generally accepted by zoo staff (as well as the public) that euthanasia should be performed when an animal’s quality of life reaches a certain “minimum” point. However, determination of this “minimum” point is difficult given the subjective nature of many measurements, human biases, temporal factors and medical factors associated with pain and suffering. Natural history and behavioral factors of the animal may also complicate these decisions.

Each institution should proactively discuss its euthanasia policy, process and philosophy and clearly define the ultimate decision maker(s) in the case of euthanasia decisions. In most institutions that authority rests with some combination of the veterinary team, animal management/curatorial team and zoo leadership. AZA accreditation standards require an institutional euthanasia policy as well as record keeping practices that accurately document the euthanasia of resident animals.

**AZA Accreditation Standards:**

1.3.2. The institution must have a written policy on responsible population management that, at minimum, incorporates all requirements contained in AZA’s Policy on Responsible Population Management [AZA’s “RPM Policy”].

1.5.0. The institution must follow a written process for assessing animal welfare and wellness.
2.9.1. The institution must have a written euthanasia policy which follows the current AVMA Guidelines for the Euthanasia of Animals, or the AAZV Guidelines for the Euthanasia of Nondomestic Animals.

6.3. The governing authority has the responsibility for policy matters and oversight of the institution. The CEO/Director must be responsible for the day-to-day management of the institution, including animal acquisition, transfer, euthanasia, reintroduction, staff, and programs.

AZA Required Documents:

☐ Policy on responsible population management that, at minimum, incorporates all requirements contained in AZA’s Policy on Responsible Population Management
☐ Annual animal inventory
☐ Written euthanasia policy which follows the current AVMA Guidelines for the Euthanasia of Animals, or the AAZV Guidelines for the Euthanasia of Nondomestic Animals.
☐

Documents to Possibly Include:

☐ Euthanasia policy - written guidelines for making end of life decisions for animals under its care including: who makes the decision, how the decision is made, and how the euthanasia occurrence will be communicated to staff, volunteers, and the public.
☐ End of Life process including who makes what decisions
☐
☐

Additional Resources:

☐ Disney’s Animal Kingdom Euthanasia policy and approval documentation form
☐ Disney’s Animal, Science, and Environment toolkit for end-of-life decisions for geriatric animals
☐ North Carolina Zoological Park criteria and process for making euthanasia decisions for collection animals
☐ Smithsonian National Zoo Criteria for Assessing Quality of Life for an Animal prior to an Elective Euthanasia Decision
☐ Taronga Conservation Society Australia – Aged animal assessment tool
☐ AAZV Guidelines for the Euthanasia of Nondomestic Animals.
There are a number of species that may be considered “pest” or “nuisance” animals in zoos and aquariums. Although there is acceptance that we must manage such species in order to maintain safe environments for the resident animals for which we are responsible, there is also an expectation that methods used are humane and that the welfare of individual animals being dispatched is being addressed. AZA accreditation standards do not mandate the way by which pest animals are managed, but do require that a pest control management program is in place. Zoos and aquariums should consider following the AZA standards (Standard 2.9.1) regarding euthanasia of resident animals when faced with the circumstance of euthanizing a pest or nuisance animal.

Additionally, AZA requires all accredited institutions to have an animal welfare concern process through which welfare issues may be addressed when necessary. This process can be extended to deal with problems arising with animals found on grounds that are not part of the resident (accessioned) population.

Accreditation Standards:

2.8.1. Pest control management programs must be administered in such a manner that the animals, staff, and public are not threatened by the pests, contamination from pests, or the control methods used.

AZA Required Documents:

☐ Pest control policy or program
☐ 
☐ 
☐ 

Documents to Possibly Include:

☐ Euthanasia policy or procedures for pest animals
☐ 
☐ 
☐ 

Additional Resources:

☐ 
☐
AZA accredited institutions participate in scientific activities, both in-situ through field conservation efforts, and ex-situ by conducting and assisting with research projects at their institutions. Each institution must have written plans and policies developed to ensure that guidelines are in place regarding scientific endeavors. Conservation and science projects undertaken or supported by AZA accredited institutions should include measures of impact to animal welfare. While some projects might have large benefits to animal welfare, some activities may negatively impact the welfare of individual animals and efforts should be made to avoid or minimize such unintended outcomes. Scientific proposals that may have an impact on animal care and wellbeing should be reviewed by a research review board or IACUC (internal animal care and use committee) to ensure that animal welfare is considered throughout the project and overall not negatively impacted. The review process for research and conservation proposals should include an evaluation component that assesses welfare during both project development and implementation in order to ensure good welfare of study animals.

AZA requires that all accredited institutions have a welfare concern process in place (Standard 1.5.8), and this process may be used if all other avenues are exhausted to address animal welfare issues arising from scientific activities.

Accreditation Standards: *None at this time regarding animal welfare and conservation*

**AZA Required Documents:**

☐ Conservation action plan/strategy (Standard 3.2.1)
☐ Scientific advancement policy (Standard 5.2)

**Documents to Possibly Include:**

☐ Review process for conservation projects, with an added welfare assessment component
☐ Review process for research projects – with welfare assessment component

**Additional Resources:**

*Welfare Considerations for Science and Conservation Proposals and Projects*
AZA Standardized Research Application Form: see www.aza.org/research_and_technology_committee
Sample research policies: www.aza.org/rc-formal-research-policy
Sample conservation action plans: www.aza.org/rc-written-conservation-action-plan
Animal caregivers working in AZA facilities are tasked with enormous responsibilities to not only keep animals healthy and safe, but also to create environments that allow animals to thrive. Where animal keepers once focused mainly on feeding and cleaning, contemporary animal care professionals provide for enhanced animal welfare empowered by their knowledge of animal behavior, behavior change principles, nutrition, enrichment, husbandry and medical procedures, and through the development and strengthening of relationships with animals in their care.

As the science of animal welfare advances and we improve our methods of assessing animal wellbeing, it is essential that animal care staff at AZA institutions maintain an understanding of the principles that underlie animal welfare in zoos and aquariums, and that they remain current on new advances through continuing education opportunities. Staff should be well versed in welfare inputs, outputs and indicators for the species and the individual animals for which they care. Zoo and aquarium leadership should also provide opportunities for professional development in animal welfare, such as support for attending conferences, workshops and classes focused on welfare, in order to deepen staff knowledge and ability to mentor others. In addition, it is important that all paid and unpaid staff at AZA institutions, regardless of department or role, receive training in animal welfare. At the very least, all paid and unpaid staff should be familiar with the animal welfare accreditation standards in section 1 - Animal Care, Welfare & Management. Ideally, the institution provides either online or in-person general training in animal welfare as part of a required orientation for new employees and volunteers, as well as an ongoing program of training in specific topics related to welfare. Available to all AZA members are two online courses taught through San Diego Zoo Global. One course is intended for all zoo and aquarium staff and provides an overview of animal welfare concepts. The second online course is more in depth and geared towards animal management staff (San Diego Zoo Global Academy “Animal Welfare General” and “Animal Welfare Professional” free online courses: http://sdzglobalacademy.org).

Accreditation Standards:

7.5. Paid full-time staff members should receive opportunities for training and development.

7.8. Paid and unpaid staff must be provided access to the latest edition of the AZA accreditation standards and related policies (available at http://www.aza.org/accred-materials/)

AZA Required Documents:

☐ AZA Accreditation standards
Documents to Possibly Include:

☐ Library of animal welfare resources (journal articles, books, etc.)
☐
☐
☐

Additional Resources:

☐ AZA professional development course Animal Welfare: Evidence-Based Management: https://www.aza.org/animal-welfare-evidence-based-management
☐ Detroit Zoological Society’s Center for Zoo Animal Welfare and Ethics: From Good Care to Great Welfare Workshop: https://www.czaw.org/events
In 2008, based on a recommendation of the AZA Animal Welfare Committee (AWC), AZA Accreditation began to include a new standard requiring member institutions to establish an Institutional Animal Welfare Process (IAWP) to allow for reporting of emerging welfare concerns within the institution and addressing them in a timely fashion. The purpose of this process is to serve as a check and balance and to provide an opportunity for staff to express concerns about welfare when normal channels of communication have been insufficient. The standard directs accredited zoos and aquariums to assure that there is no retribution as the result of communicating a welfare concern. The recommendation for such a process also included the possible formation of an internal Animal Welfare Committee (IAWC).

Accreditation Standards:

| 1.5.8 The institution must develop a clear process for identifying communicating, and addressing animal welfare concerns within the institution in a timely manner. |

AZA Required Documents:

- Animal welfare concern process
- There is a specific question on the accreditation questionnaire asking institutions to provide supporting documentation of the welfare concern process. Therefore, institutions should keep good records of the reporting, investigation, and resolution of concerns brought up through this process.

Documents to Possibly Include:

- Animal welfare assessment form

Additional Resources:

The following appendices provide sample welfare assessments and documents used at several AZA institutions. While there is no one recommended standard welfare assessment document, each of these examples considers a combination of both inputs and outputs to allow animal care staff to make evidence-based conclusions regarding individual animal welfare. From these assessments, the welfare team can determine what, if any, course of action is warranted to address welfare concerns or otherwise make changes to improve animal wellbeing.
Species:

Natural History Questions

Habitat
1. What is the species’ natural habitat (e.g. arboreal, aquatic, desert, rainforest, cover, moisture, concealment/camouflage options, temperature ranges, barriers from conspecifics)? Does it switch between habitats at times? Please include temperature ranges and optimal temperature/weather.

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Temp range</th>
<th>Weather</th>
</tr>
</thead>
</table>

Behavior
2. When is it most active?
3. Does the activity pattern change seasonally?
4. Where and when does it sleep or rest? How does it prepare a nest or den? How much time does it spend there?
5. What are some self-maintenance/comfort behaviors (preening, grooming, bathing, dust bathing, wallowing, sunning, etc.)?
6. Does it normally molt or shed?
7. What are the main threats to survival in the wild? i.e. what is this species likely to be afraid of?

<table>
<thead>
<tr>
<th>What are its predators?</th>
<th>How do they prey upon this species?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How does it detect predators?</td>
<td></td>
</tr>
<tr>
<td>Are there anti-predator behaviors (e.g. broken wing display)?</td>
<td></td>
</tr>
<tr>
<td>Where and how does this species seek refuge from predators?</td>
<td></td>
</tr>
<tr>
<td>What to fear behaviors look like?</td>
<td></td>
</tr>
</tbody>
</table>
8. How does it communicate with conspecifics?

Social structure
9. What is the social structure of the species?
   a. Average group size? Does it change?
   b. Does the group disperse? ☐ Yes ☐ No
   c. If Yes, who typically leaves and at what age?
10. What is the average territory size?
   a. How does it defend its territory?
   b. How does it advertise its territory?
   c. Does it migrate?

11. What are typical social behaviors?

12. What are typical sensory modalities?

13. What is the range of hearing?

14. What wavelengths of color can this species see? How good is eyesight?

Reproduction
15. What is the breeding season? How long is gestation?

16. What do breeding/solicitation behaviors look like?

17. How does it attract a mate (i.e. what do sexual display behaviors look like?)

18. How and where does it raise its offspring? Who feeds it? How? (i.e. are the young precocial or altricial?)

Feeding
19. What does it eat? When? Does the diet change seasonally?

20. How does it find and obtain food in the wild?

References Cited:
1.
2.
3.
4.
5.
**Individual Animal History**

1. Where did this animal come from? □ Born at this facility? □ Other Zoo/Aq:
2. If from another zoo, what type of enclosure/social group?
3. Was this individual □ parent-raised or □ hand-raised?
4. Is the animal managed in a □ social group or □ as an individual?
5. What does it look like when this animal is comfortable/calm?
6. How does this animal respond when stressed?
7. Can the animal be easily separated from the social group? □ Yes □ No □ Sometimes (describe)
8. How does the animal behave when separated?
9. How does the rest of the group behave when that animal is separated?
10. How does this animal currently respond to its caretaker (both during keeper-solicited interactions and outside of planned interactions)?
   a. To new staff members?
   b. To veterinarian?
   c. To visitors/guests/strangers?
   d. Are there times of the day when this animal seems most receptive to the keeper?
      e. Is there any noticeable reaction to a particular gender (men vs. women)?
11. What is this individual animal’s normal diet?
    a. What are the food items that seem to be the most desirable to this individual?
    b. What is the feeding routine for this animal?
12. What is this animal’s normal daily routine?
    a. How often is enrichment provided
    b. Training sessions?
13. Are there any medical conditions that need to be monitored? □ Yes □ No
    If yes, please describe
14. Does this individual animal have any medical problems or behavioral problems?
    □ Yes □ No  If yes, please describe
Facility Considerations
1. Is there a space that is safe for the keeper, veterinarian, and animal to interact? Is this a space that the animal can have easy access to?

2. Does the facility allow animals to be easily separated from one another or moved easily?
   □ Yes □ No

3. Does the facility provide opportunities for keepers to offer enrichment throughout the day?
   □ Yes □ No

4. Are there visual barriers from enclosure mates and the public?

5. Is there moveable furniture on exhibit? Ability to change furniture?

6. Are traffic patterns changeable?
The following is an example of a more intensive welfare assessment conducted on 3 cheetahs at the Toledo Zoo. The assessment spans a month’s time and includes physical measures, such as body condition, coat condition, and fecal consistency, behavioral data and recent medical history. Some information, such as identification of the individual animals, has been modified and portions of the analysis have been removed or truncated to eliminate redundancy, as similar graphs and multiple variables were assessed for each animal. At the end of the analysis is a list of positive welfare indicators, areas of question or concern, and suggestions for improvement. Once an assessment is complete, the results are discussed with the welfare team for the species and action plans developed if needed. Behavioral measures for each assessment may vary from species to species or seasonally. These might include 24-hour activity, habitat use, social interactions, or a multitude of other measures that would indicate an animal’s welfare state and are conducted as often as needed (e.g. seasonally, annually, with animals moving in or out of the social group) to accurately assess wellbeing over time.
XYZ Zoo Cheetah Population

<table>
<thead>
<tr>
<th>Accession #</th>
<th>House name</th>
<th>DOB</th>
<th>Number of transfers</th>
<th>Date of transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>11111</td>
<td>Alpha</td>
<td>6/27/2014</td>
<td>1</td>
<td>10/9/2015</td>
</tr>
<tr>
<td>11112</td>
<td>Beta</td>
<td>6/27/2014</td>
<td>1</td>
<td>10/9/2015</td>
</tr>
</tbody>
</table>

Physical Measures

Weights: Typical weight range of wild cheetahs: 35-57 kg

Weights of XYZ Zoo Cheetahs (kg)

<table>
<thead>
<tr>
<th>Name</th>
<th>4/16/16</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>45.4</td>
<td>Within normal range</td>
</tr>
<tr>
<td>Beta</td>
<td>49.8</td>
<td>Within normal range</td>
</tr>
<tr>
<td>Charlie</td>
<td>48.3</td>
<td>Within normal range</td>
</tr>
</tbody>
</table>

Body condition (1-5 scale with 1 being very thin, 3 being ideal, and 5 being obese) – see attached scale

<table>
<thead>
<tr>
<th>Name</th>
<th>Body Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>3.5</td>
</tr>
<tr>
<td>Beta</td>
<td>3.5</td>
</tr>
<tr>
<td>Charlie</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Coat condition (1-3 with 1 being moderate hair loss and 3 being good condition)

<table>
<thead>
<tr>
<th>Name</th>
<th>Coat Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>3</td>
</tr>
<tr>
<td>Beta</td>
<td>3</td>
</tr>
<tr>
<td>Charlie</td>
<td>3</td>
</tr>
</tbody>
</table>
Physical exam
All three cheetahs received physical exams on x/xx/2016. All findings were within normal ranges; however body condition scores for all three cheetahs were 3.5/5 and all are now on a 5 lb. weight loss program.

Fecal condition
Fecal scales developed by the AZA Felid TAG define fecal condition based on form and consistency. XYZ Zoo cheetah keepers have identified fecal sample quality based on the diet. Both scales are listed below. Keepers noted fecal form daily. On 17 of 18 days, normal feces were noted. One pile of loose stool was noted throughout the study.

<table>
<thead>
<tr>
<th>XYZ Zoo Cheetah Fecal Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brown Formed</strong></td>
</tr>
<tr>
<td><strong>Black and Tarry</strong></td>
</tr>
<tr>
<td><strong>Brown with blood and mucus</strong></td>
</tr>
<tr>
<td><strong>Bone day</strong></td>
</tr>
<tr>
<td><strong>Diarrhea</strong></td>
</tr>
<tr>
<td><strong>Other</strong></td>
</tr>
</tbody>
</table>
Behavioral Measures

Data were collected three times per day during 15-minute observations from April 8 to April 22, 2016. The cheetahs typically go on exhibit after 9:30 AM and come off exhibit at 4:30 PM each day. Thus, the data presented in this report represent that 7-hour period of time while they were on exhibit.

All three cheetahs showed similar activity budgets. Inactive but alert and pacing/patrolling the exhibit were the most commonly observed behaviors. Combined, these two behaviors account for 61% to 65% of each cheetah’s day.

None of the cheetahs were observed using enrichment throughout the day, with the exception of Beta who was observed manipulating an object during 2 observations.

During the observations in which the cheetahs were scored as inactive – alert, they were primarily lying down. Lying accounted for 75-82% of inactive observations.

All three cheetahs showed similar interest in human activity (5-6%). Most of this activity was focused on the service drive.

General activity budgets (a): 9:30 am – 4:30 PM

Alpha

Beta

Alpha’s most frequently observed behavior was inactive but alert

He patrolled the exhibit 26% of the time. Combined, these 2 activities account for 63% of his time on exhibit.

Feeding was observed on 1 occasion when ribs were offered on exhibit.

Inactive but alert was the most frequently observed behavior.

Inactive – alert and patrolling combined totaled 61% of Beta’s day.

Beta was the only cheetah observed using enrichment—and only twice during observations.
The following graph represents data from 1 animal. Similar graphs could be developed for each animal.

**Alpha Behavior by Hour**

- When first out in the morning, Alpha tends to spend a little time investigating (teal) his exhibit. Feeding (orange) and hunting behavior occur only in the morning when first outside. By 11:00, he no longer feeds (but has been observed chasing birds and rabbits in and around the exhibit occasionally throughout the day).

- By 11:00 Alpha tends to spend considerable time patrolling the perimeter of the exhibit and does so throughout the day. Patrolling decreases mid-day, when Alpha spends more time resting (inactive, alert).

- In addition to patrolling, which occupies 26% of his day, Alpha also walks throughout the exhibit for a portion of each hour (magenta). Thus, the pacing/patrolling is not stereotypic but appears to be a vigilance behavior.
The cheetahs are shifted inside by 4:30 each day; thus the out of view at the 4:00 hour (16) is due to the cheetahs shifting inside the building during observations.

**Overall Assessment:**

All three cheetahs seem to experience good to excellent welfare.

**Signs of good welfare include:**
- All three cheetahs have ideal coat conditions.
- All three cheetahs experience good physical health based on their most recent physical exams.
- Fecals appear within the normal range for the diet provided. While individual fecal samples could not be identified, there were no fecal samples that caused welfare concerns.
- Each cheetah’s activity budget seems reasonable for this species. They tend to rest a portion of the day and spend some time walking around and exploring their environment. This seems appropriate for their age. However, little hunting-type or chasing behavior was observed.

**Areas of concern or question:**
- All three cheetahs weigh within the weight range of wild cheetahs. However, each is slightly over conditioned based on the body condition scoring developed by the AZA Felid TAG.
- While behavioral diversity is good, the cheetahs have not utilized enrichment. Effective enrichment would likely encourage species-typical behaviors and provide the cheetahs with more choices within their day.
- While the activity budgets are currently appropriate, the potential for patrolling behavior to become stereotypic in the future should be considered. While the cheetahs are active for a relatively large portion of the day, the behavioral repertoire could be increased through additional exhibit modifications, enrichment variability, and areas to retreat.

**Recommendations**
- Conduct evaluation on enrichment offered to determine behaviors encouraged through specific items and activities.
- Train the cheetahs to shift inside on a recall, and then introduce the lure course as enrichment to increase exercise (and to promote weight loss) and to elicit hunting behavior.
- In order to increase opportunities for the cheetahs to have control and choices within their day, offer them access on exhibit for as long as possible during the day and at night if feasible.
The following is an example of a welfare assessment using the WelfareTrak program developed by the Chicago Zoological Society's Brookfield Zoo. See [https://www.welfaretrak.org/](https://www.welfaretrak.org/) for details.

<table>
<thead>
<tr>
<th>Poor</th>
<th>Excellent</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appetite-Drinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feces-Urine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactions with Keepers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobility-Posture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of Space</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never-Always</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behaviors to Watch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comfortable-Relaxed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interested in the Environment-Curious</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performs Self-Directed Behaviors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Playful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produces Positive Vocalizations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Throughout this document and especially in the chapter on inputs and outputs, we've described methods for assessing the welfare of individual animals. When animals are managed as individuals (individually identifiable, have individual medical records, individual animal records, etc.), animal welfare should be assessed at the individual level. However, when animals are managed as a group, for example in a large aquatic tank, the individual animal assessment approach is not appropriate. Instead, we suggest that the welfare of the group is assessed in its habitat. Below is an example of that approach.

Sea Weed Garden – KELPZONE E5

Exhibit Description:

This exhibit displays various species of algae as well as juvenile and small fishes. The exhibit dimensions are approximately 62" x 44" and 48" deep, with one curved acrylic window panel. There is a faux rock insert, with live rocks in front and on top of it.
**Animal Sources:**

Dive in local kelp beds and rocky reefs. Lumpsuckers and tubesnouts may also be purchased from collectors from Vancouver. Yearly diving in Catalina can provide most of the juvenile fish species. Smaller fish can also be graduated up from Top O’ the Canopy to the Seaweed Garden.

Algae can be collected in Carmel, Shale, or the Wharf and glued to rocks for increased successful growth. Tidepooling trips during negative tides to Pebble Beach and Davenport are also great for various reds, browns, and surf grass. Additionally, Ulva sp. can be collected by hand around the docks in Monterey.

**Species List:**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Approximate Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fishes:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crevice Kelpfish</td>
<td>Gibbonsia montereyensis</td>
<td>2-4</td>
</tr>
<tr>
<td>Sculpin</td>
<td>Scorpaena guttata</td>
<td>1-2</td>
</tr>
<tr>
<td>Opaleye (*)</td>
<td>Girella nigricans</td>
<td>5-10</td>
</tr>
<tr>
<td>Tubesnout</td>
<td>Aulorhynchus flavidus</td>
<td>6-10</td>
</tr>
<tr>
<td>Juv. Garibaldi (*)</td>
<td>Hypsypops rubicunda</td>
<td>1-2</td>
</tr>
<tr>
<td>Juv. Cal Sheephead (*)</td>
<td>Semicossyphus pulcher</td>
<td>1-2</td>
</tr>
<tr>
<td>Juv. Blacksmith</td>
<td>Chromis punctipinnis</td>
<td>10-15</td>
</tr>
<tr>
<td>Juv. Perch</td>
<td>H. caryi, B. frenatus, or H. azurea</td>
<td>2-5</td>
</tr>
<tr>
<td>Juv. Painted greenling</td>
<td>Oxylebius pictus</td>
<td>1-2</td>
</tr>
<tr>
<td>Juv. Senorita</td>
<td>Oxyjulis californica</td>
<td>1-3</td>
</tr>
<tr>
<td>Juv. Kelp Bass</td>
<td>Paralabrax clathratus</td>
<td>1-3</td>
</tr>
<tr>
<td>Juv. Giant Sea Bass</td>
<td>Sterolepis gigas</td>
<td>1</td>
</tr>
<tr>
<td>Monkeyface Prickleback</td>
<td>Cebidichthys violaceus</td>
<td>1</td>
</tr>
</tbody>
</table>
Rock prickleback           Xiphister mucosus           1

(*) Aggression toward tubesnouts should be considered when mixing these species.

**Invertebrates:**

<table>
<thead>
<tr>
<th>Invertebrate</th>
<th>Species</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bat star</td>
<td>Asterina miniata</td>
<td>1-3</td>
</tr>
<tr>
<td>Giant Green Anemone</td>
<td>Anthopleura xanthogrammica</td>
<td>3-5</td>
</tr>
<tr>
<td>Stubby rose anemone</td>
<td>Urticina coriacea</td>
<td>3-5</td>
</tr>
</tbody>
</table>

**Plants:**

<table>
<thead>
<tr>
<th>Plant</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull kelp (small)</td>
<td>Nereocystis luetkeana</td>
</tr>
<tr>
<td>Sea Lettuce</td>
<td>Ulva sp.</td>
</tr>
<tr>
<td>Oar Weed</td>
<td>Laminaria dentigera</td>
</tr>
<tr>
<td>Sea Grapes</td>
<td>Botrycladia pseudodichotoma</td>
</tr>
<tr>
<td>Bleach Weed</td>
<td>Prionitis sp.</td>
</tr>
<tr>
<td>Surf Grass</td>
<td>Phyllospadix scouleri</td>
</tr>
<tr>
<td>Coralline Algae</td>
<td>Calliarthon sp.</td>
</tr>
<tr>
<td>“Deeper” red Algae</td>
<td>Gigartina sp., Rhodomenia sp., Calliarthon sp., Plocamium sp.</td>
</tr>
<tr>
<td></td>
<td>Botrycladia sp.</td>
</tr>
<tr>
<td>Bead Kelp/Bladder Weed</td>
<td>Cystocseira osmundacea</td>
</tr>
<tr>
<td>Eisenia</td>
<td>Eisenia arborea</td>
</tr>
<tr>
<td>Pterygophora</td>
<td>Pterygophora californica</td>
</tr>
</tbody>
</table>
Animal Welfare Goal and Evaluation

I. Nutrition - Receive nutritionally complete diets that bring out the natural feeding response and behavior

Inputs:
Are food items offered appropriate for all tank inhabitants?

Outputs:
Are natural feeding responses present?
Are aggressive feeders over-fed?
Are the timid feeders under-fed?
Is there any evidence of nutrition-related disease?

II. Health - Experience good physical health

Inputs
If tank occupants become sick, is treatment possible?
Is tank lighting (intensity, spectrum, photoperiod) appropriate?
Is tank temperature within POTZ?

Outputs
Do the tank occupants appear to be in good health?
If not, do the health issues appear to be associated with the tank environment? Are animal longevity and/or mortality rates consistent with that encountered in the free-ranging population?

III, IV. - Environment and Behavior - Are afforded comfortable living experiences with choice and control to promote mentally and physically healthy behaviors. Are provided quality spaces to live in with appropriate social groupings that promote natural, species-appropriate and motivated behavior. Develop natural coping skills and avoid chronic stress

Inputs
Does the enclosure provide naturalistic habitat appropriate for occupants? Do the tank furnishings provide adequate environmental variability for occupants to have viable behavioural choices? Is the use of the exhibit space consistent with normal species behaviors?
Is the exhibit space design consistent with the natural history of the occupants?

Are species being held in appropriate social groupings? Does the exhibit design provide occupants the ability to employ species-specific coping mechanisms to avoid chronic stress?

**Outputs**

Do any species exhibit repetitive or stereotypic behavior?

Does animal behavior appear species-specific “normal”?

Does sex ratio appear normal and are any social or health problems associated with ratio?

Do any animals within tank appear stressed?

Is there any evidence of excessive intra- or inter-species aggression?

Are any individuals demonstrating consistent or persistent abnormal social behavior or abnormal isolation from con-specifics?
References


Razel et al. (2017)


