

A Universal Animal Welfare Framework for Zoos

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The Detroit Zoological Society's (DZS) Center for Zoo Animal Welfare (CZAW) was created to advance the science and policy of the welfare of exotic nonhuman animals in captivity. This important part of the DZS mission is achieved through assessments of, and research on, the welfare of animals in zoos; by recognizing extraordinary achievement in the advancement of animal welfare; by widely sharing knowledge through a bibliographic resource center; by conducting professional training for animal care staff; and by convening important discussions in the form of international symposia. This special issue of the *Journal of Applied Animal Welfare Science* features selected papers from the most recent international CZAW symposium held at the Detroit Zoo in November 2014, as well as a universal framework for zoo animal welfare developed by the DZS.

Keywords: animal welfare, zoo, welfare assessment, framework

Nonhuman animal welfare has been a widely studied topic for decades, especially in animals on the farm, but it has only been significantly gaining in importance in zoos and aquariums in recent years. Global welfare efforts for animals in zoos have increased with accrediting bodies such as the World Association of Zoos and Aquariums, the Association of Zoos and Aquariums (AZA), and the Zoo and Aquarium Association of Australia forming official committees for animal welfare and developing welfare strategic plans and approaches. Additionally, individual institutions, such as the Detroit Zoological Society (DZS) and Chicago Zoological Society in the United States and Zoos Victoria in Australia, have committed dedicated welfare-specific scientific staff and resources to studying and improving zoo animal welfare.

An initial challenge in advancing animal welfare is agreement on the definition of animal welfare. Although a universally accepted definition has not been agreed upon in the zoo and other professional communities and, indeed, various entities have developed their own definitions (e.g., AZA Animal Welfare Committee, American Veterinary Medical Association, and the World Organisation for Animal Health), the way in which welfare is typically described is often based on the five freedoms (Brambell, 1965). These freedoms include the freedom from thirst and hunger, freedom from fear and distress, freedom from discomfort, freedom from pain and suffering, and freedom to express normal behaviors. Additional freedoms have been proposed over the years,

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such as freedom from boredom (Ryder, 1998) and freedom to exert control over quality of life (Webster, 1995). Similar to the five freedoms, a “five domains” model has also been utilized to describe the elements of animal welfare (Mellor, Patterson-Kane, & Stafford, 2009). The domains are composed of four physical domains including nutritional, environmental, health, and behavioral and a mental domain concerned with the cognitive or affective states of animals.

However, determining the welfare status of individual animals, and thereby the overall success of zoos’ and aquariums’ welfare efforts, has largely focused on what is actually animal care—what is provided to animals. This includes access to food, water, and shelter, as well as to veterinary care. These are all necessary components of welfare, but they do not, in and of themselves, ensure good welfare (Kagan & Veasey, 2010). The truly important step is ensuring that conditions exist so each animal living in captivity has the potential to experience great welfare. This step requires the development and use of techniques to assess all potential indicators of welfare, including the emotions, or affective states, of animals. It also requires ensuring that each animal has “agency,” or the ability to make meaningful choices during the course of each day for his or her entire life and to exert control over the important outcomes in his or her life. Creating conditions that lead to good welfare may even produce a positive-feedback mechanism that further advances welfare, as observed by Franks, Champagne, and Higgins (2013) who saw that animals in a positive welfare state were more likely to engage in behaviors that enhance welfare.

Ensuring the well being of animals requires institutional knowledge, expertise, and commitment, as well as comprehensive and robust programs of measuring, implementing, and evaluating animal care and welfare practices. These requirements can be achieved by utilizing a framework that outlines the necessary components for establishing animal welfare programs and provides tools for evaluating them. Institutions employing an animal welfare framework will begin in different places on the framework depending on their existing programs, but they need to achieve every component to be successful in ensuring good welfare for all zoo and aquarium animals.

During the last two decades, the DZS has been developing policies, practices, and procedures that reflect a fundamental focus on the welfare of individual animals in the resident populations of the Detroit Zoo and Belle Isle Nature Zoo. Based on the DZS philosophical/operational roadmap and experiences, the Center for Zoo Animal Welfare led the development of a universal framework for zoo animal welfare and shared this effort at its international animal welfare symposia in 2012 and 2014.

The zoo animal welfare framework described in this article is designed to facilitate development and execution of a sustainable, science-based, and compassionate approach to ensuring great welfare for each animal in AZA-accredited zoos (the term “zoo” refers to zoos and aquariums), with the core principle of ensuring that animals in zoos thrive, not just survive, physically, psychologically, and socially.

The framework is composed of four major components: institutional philosophy and policy, reflecting values, commitment, and capacity building; programmatic structure and resources; execution; and evaluation (Figure 1). All components are necessary parts of an adaptive system that ensures excellent animal well being.

INSTITUTIONAL PHILOSOPHY AND POLICY

An institutional commitment to ensuring that each animal is thriving, not just surviving, is the fundamental basis of the framework. Commitment requires recognition of responsibility to

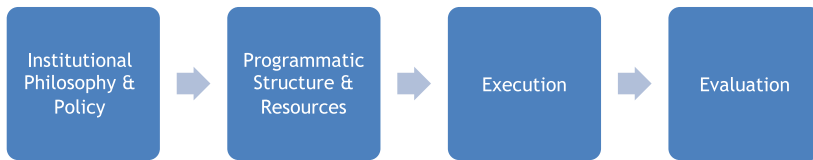


FIGURE 1 Universal animal welfare framework outline.

provide high-quality life experiences for every hour of every day for all individual animals from cradle to grave. It is built upon the understanding that an individual animal’s ability to exert meaningful choice and control is central to his or her welfare (Kagan & Veasey, 2010). It recognizes that great care—what we do for and provide to animals—does not guarantee great welfare—what animals experience. Transparency, open discussion, accountability, and a consistent approach to execution and evaluation are necessary. Institutional policies must reflect the commitment to a great life experience for every individual, and the process by which policies are developed and executed must be adaptive and compassionate.

Allocating resources necessary to demonstrate commitment to great animal welfare underpins successful program development and execution. This includes allocating significant dedicated resources to animal welfare just as many zoos are now doing for conservation.

PROGRAMMATIC STRUCTURE AND RESOURCES

Comprehensive Approach

Ensuring excellent welfare begins with institutional population planning. The core principle driving population planning must be the quality of life experiences for each animal, not quantity of animals or species. Selecting species that can thrive in a given physical and climatic environment is critical.

Institutions and cooperative species management programs must work closely together to balance the needs of the entire population with the welfare impacts on individual animals including those for transfer, introduction, breeding, and contraception decisions.

Changes in institutional plans should not result in compromised welfare for animals who are no longer in the plan. High-quality environments must be provided for animals removed from plans, “retired” from breeding programs, or removed for other reasons, and who are maintained permanently out of public display (Carter & Kagan, 2010). Providing high-quality environments for these animals requires a business model that accepts likely increased costs as a result of provisions for the welfare of animals from cradle to grave.

Environmental design must develop from an understanding of the sensory ecology and natural history of a species to incorporate environmental and social features that allow animals to express species-typical behaviors and to experience a species-appropriate milieu and gradient of conditions (lighting, temperature, noise, scents, and substrates; Kagan & Veasey, 2010). Design must include consideration of individual animals as well as species, and welfare must be fundamental to thinking and planning. Environmental design, as well as physical and programmatic planning, must consider the 24-hr lives of animals, not just the work shifts of the animal care staff or the demands and expectations of zoo visitors. Similar standards must be applied to holding areas or behind-the-scenes areas.

Zoos rely heavily on compensatory strategies like environmental enrichment, which may only be modest at best in their effectiveness in addressing the challenges of captive life. Significantly more proactive and comprehensive approaches to exhibit design that address all needs must be in place to ensure that captive environments provide species-appropriate complexity and can ensure the well being of animals. This requires adopting an “animal-centered” approach, much like the “patient-centered” model adopted by many human health care systems/providers.

Agency, or the ability for animals to make relevant choices and exert control over meaningful aspects of their lives, is critical. Each animal should be able to decide, as much as possible, where to spend their time within their habitat; the times at which they prefer to demonstrate their range of behaviors (e.g., feeding, moving between available locations); when and with whom they engage socially, including both group mates and humans; and their proximity to others, including staff and zoo visitors.

The staff members who care for animals are important elements of animals’ environments, and the quality of the relationships with the humans who care for them has an impact on the welfare of animals (Whitham & Wielebnowski, 2013). It is important to understand animal–human relationships and how these relationships affect animal well being.

A compassionate approach to individual animals should extend beyond zoos’ walls. Zoo professionals are concerned with the well being of animals in their care and are similarly concerned with the well being of species and populations of animals in nature. They are uniquely positioned to bridge animal welfare and conservation by taking measures to mitigate and minimize harm to individual animals in their field conservation programs. The well being of individual animals (animal welfare) and well being of species (conservation) are critical obligations of zoos that overlap on numerous levels. Better integration of both fields can lead to greater success (Fraser, 2010; Swaisgood, 2010).

Capacity Building

Commitment to capacity building includes developing an ethic and expertise in staff positions currently dedicated to animal care and conservation such as animal program directors/leaders, curators, veterinarians, enrichment coordinators, and scientists charged with oversight and improvement of animal welfare and animal welfare science. These positions should be fully integrated into an organization’s operational infrastructure to ensure that welfare needs are considered and addressed in habitat design, population planning, animal care and management, and those nonanimal operational programs and activities that impact animals (e.g., routine maintenance, special events).

Additionally, institutions should have staff capacity and adjunct/consulting positions to reinforce strong science and ensure rigor in program development, execution, and evaluation. An Animal Welfare and Care Committee, made up of leaders and staff responsible for animal welfare, animal care, and animal health, must be empowered to guide animal welfare discussions and processes developed for the institution as part of animal management. There should be external review and participation.

Staff Training

Creating conditions that improve animal welfare is the responsibility of every staff member in an institution; therefore, developing a program of mandatory animal welfare training for all staff is

necessary. The program needs to include both a basic level for all staff and a more advanced level for staff directly impacting animal welfare (animal care, animal health, facility design, maintenance, and grounds/landscape). Providing opportunities for continuing education and professional development to ensure that animal welfare programs remain current is necessary.

Animal Welfare Communication Process

A process by which staff, volunteers, and zoo visitors can communicate questions or concerns about animals and receive feedback/responses is important to maintaining transparency and engagement of staff, volunteers, and visitors in ensuring the well being of animals. An animal welfare concern-reporting process is now a requirement of AZA-accredited institutions (AZA, 2015), and it is typically structured so that staff members, volunteers, or visitors communicate questions or concerns about animals through appropriate chain-of-command communication channels and receive a written response following investigation of the concern.

Compassionate Policies

The development of policies that begin with the individual animal is critical. Central to this is the development of an acquisition, transfer, and transition policy that reflects a commitment to an individual animal's lifelong welfare, not just genetic or population management goals. Other policies, including those for research, euthanasia/culling, and "program" animals, must also have animal welfare as a fundamental priority.

EXECUTION

Leadership

Strong, animal welfare-centered programmatic structure and significant resource allocation provide the foundation for both the execution and evaluation of practices, programs, and policies. Organization leadership (chief executive officer/director) is ultimately responsible for the institution's performance, including performance with respect to the welfare of its animals. Institutional leadership must establish priorities and allocate resources that advance animal welfare. The Animal Welfare and Care Committee should be charged with direct responsibility for developing and implementing policies and programs to understand, improve, and evaluate welfare.

Staff Training

Animal welfare training and ongoing professional development around animal welfare should include a basic training module for all staff that defines welfare and explains the main components of welfare. It should help staff understand that each animal is an individual with a unique personality and needs, that welfare is experienced by (and therefore measured in) individual animals, and that welfare occurs on a continuum from poor to excellent. A critical part of training must also be to ensure that the institution's animal welfare communication process is understood by all staff.

An advanced training process for all staff directly impacting the welfare of animals should include sensory ecology (the world from the perspective of the animals), impacts of captivity (what constraints are placed on animals in captive settings), positive (e.g., play behavior, relaxed

postures) and negative (e.g., self-injurious behavior, stereotypes, and poor health) indicators of welfare for species and individuals, importance of choice and control for individuals, compensatory strategies (environmental enrichment), integration of training into overall husbandry and management, and instructions in how to assess welfare.

Staff must understand the difference between inputs (what is provided for animals) and outputs (what animals experience) and why assessing each is important. Understanding inputs, such as how much and what type of space an animal has, his or her access to social partners, and opportunities for the animal to make meaningful choices, is important, but inputs are not measures of welfare. Assessing outputs—or the responses of animals to their environments, including behavior, hormone profiles, health measures, and affective states—is necessary to understand their well being.

Comprehensive Approach

Ensuring that staff members responsible for the welfare of animals are involved in population planning, at both the species level and individual level, is crucial. The same process needs to be employed for environmental design. Animal welfare staff, along with curatorial, animal care, and animal health staff members, should be part of the processes of designing and operating the captive environments provided for animals. Institutional capacity to conduct preoccupancy and postoccupancy evaluations of habitats is important to ensure that processes are adaptive and effective at ensuring animal welfare.

Specific welfare plans for individual animals should be created that include physical, mental, emotional, and social needs of individuals including natural history, specific constraints of captivity for that species, individual history, the factors that will be included to meet the needs of the animals (e.g., physical space, social opportunities including keeper–animal relationships, sensory environment, training and enrichment, nutrition, and veterinary needs), and how inputs and outputs will be measured.

EVALUATION

Assessing institutional commitment, policies, structure, resources, and programs is the purpose of the universal framework tools, and it is critical to ensuring that an understanding of the full needs of animals, learned through assessing the welfare of individual animals, is translated into programs and practices that meet those needs.

Systematic, scientific research to assess the well being of individual animals is not the aim of the universal framework tools. Scientific studies must be undertaken by individuals with knowledge and expertise in animal welfare and animal welfare science, including strong familiarity with species-specific animal welfare needs and proficiency in welfare assessment techniques (i.e., data collection, analysis and interpretation, and specialized knowledge in methodologies including behavioral and physiological measures of well being). Scientific rigor is critical to a full understanding of the results as well as to broad and effective dissemination and application of what is learned. The framework tools are designed to provide a snapshot of conditions and states and to identify possible concerns or conditions for which focused, systematic research may be needed to understand an animal's welfare state.

Two tools have been developed as part of the universal framework and are provided in the appendices. One is for evaluation at the level of the institution (see Appendix A), and it examines policies, resources, programs, and practices. The second tool provides assessment at the level of individual animals and habitats (see Appendix B). It identifies both resource-based and animal-based areas that may be of concern with respect to animal welfare, and it can help set animal welfare priorities. Together, the tools can reveal the current state of an institution's animal welfare processes and programs. The tools were tested and refined at the DZS international symposium in 2014 and in comprehensive animal welfare assessments at a number of zoos.

The tools are designed to be conducted from first-, second-, or third-party perspectives; each perspective is different in application and objectivity, but all are important in helping to ensure good animal welfare. First-party evaluations are conducted internally by the institution's own staff and provide a self-assessment against the institution's own standards. First-party evaluations are a good mechanism for self-evaluation and healthy self-criticism at the institutional level. First-party evaluations should be conducted by multiple members of the institution's staff, including care staff, curators, veterinarians, and animal welfare scientists, to achieve meaningful reliability and objectivity. First-party evaluations can provide an important means of frequent feedback and continuous refinement.

Second-party evaluations are undertaken by an external evaluator who is familiar with the institution being assessed. Second-party evaluations offer greater objectivity and the benefit of a more independent review to programs and practices from a critical but "friendly" perspective.

Third-party evaluations are conducted by an external individual with no relationship with the institution being evaluated (i.e., by knowledgeable welfare professionals from other regions). Third-party evaluations are generally seen as the most impartial and objective method.

CONCLUSION

Science, common sense, and compassion must be used when evaluating the well being of animals in zoos. The universal framework described here has been developed to depict the critical components necessary to understand and improve how zoo animals are faring and to provide tools to assist with both. Understanding that an institution's philosophy and policies are critical foundations for good animal welfare is necessary, as are execution of programs to understand and improve welfare and continuous evaluation and refinement of programs and practices. Great animal welfare is the responsibility of every person working in a zoo. This universal framework provides a roadmap for zoos to follow to achieve great welfare, and though cultural differences will have some impact, the framework should work independently of those differences because the key is how the animals experience life in captivity.

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APPENDIX A

Detroit Zoological Society Institutional Welfare Policies and Programmatic Structure Assessment

<i>Institution:</i>	<i>Date:</i>	<i>Yes</i>	<i>Somewhat</i>	<i>No</i>	<i>Not Clear</i>	<i>Notes</i>
1.	Does it appear that there is a clear commitment to animal welfare at the executive and management levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2a.	Are there written and comprehensive policies with respect to animal welfare?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2b.	If yes, please provide the policies.					
3a.	Are there official welfare positions designated to the oversight of animal welfare?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3b.	If yes, please list their titles in the Notes section.					
4a.	Is specific training in animal welfare conducted? If yes, please note how often it is conducted, for whom, and by whom in the Notes section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4b.	Is advanced training in animal welfare conducted? If yes, please note how often it is conducted, for whom, and by whom in the Notes section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4c.	How is the training evaluated and by whom?					
5a.	Does the zoo have an animal welfare concern-reporting process?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5b.	If yes, please note who is responsible for the process oversight and coordination in the Notes section.					
6.	Does the zoo have an acquisition, transfer, & transition policy that reflects commitment to the welfare of individual animals during the course of their lifetimes (e.g., prohibits transfer to situations that would compromise welfare)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7.	Please describe the process by which your institution evaluates the impact of management practices on animal welfare.					
8.	How does the environment (habitat) design and construction process incorporate animal welfare considerations?					<input type="checkbox"/>

(Continued)

(Continued)

<i>Institution:</i>	<i>Date:</i>	<i>Yes</i>	<i>Somewhat</i>	<i>No</i>	<i>Not Clear</i>	<i>Notes</i>
9. How does species selection for the resident living population incorporate animal welfare considerations (e.g., is the climate right, are the size and complexity of the environment right, is the social environment appropriate)?		<input checked="" type="checkbox"/>			<input type="checkbox"/>	
10. How are your conservation programs compassionate (e.g., how do they incorporate animal welfare considerations)?		<input checked="" type="checkbox"/>			<input type="checkbox"/>	
11. After completing the full assessment of this facility, does it appear that the Individual Animal/Environment assessments support the Institutional Policies and Programmatic Structure Assessment?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

APPENDIX B

Detroit Zoological Society Individual Animal/Environment Welfare Assessment

The social and physical environment defines the quality of life of an individual animal. This tool is meant to reveal what those conditions are and in turn provide insight into the welfare of an individual animal. Please note that this assessment can be filled out for an individual housed singly, housed as part of a group, or for a group of individuals housed together. Results can differ between individuals housed as part of the same group.

<i>Institution:</i>	<i>Date:</i>	<i>Yes</i>	<i>Somewhat</i>	<i>No</i>	<i>N/A</i>	<i>Not Clear</i>	<i>Notes</i>
<i>Individual/Environment:</i>							
1. Does it appear that physical environments meet the needs of the animals in terms of basic provisions (food, water, and shelter), size, complexity, construction, landscape/substrate, design (i.e., is ratio of land to water appropriate, can flighted bird species fly, etc.)?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Do environments provide climatic conditions (temperature, humidity) similar to natural environment/appropriate for the species?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3a. Does each animal have 24-hr access to primary physical and social environments (habitat)?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3b. Are multiple groups or individuals required to rotate through the same primary environment (habitat; e.g., “timeshare” the primary space and spend the rest of their time in back areas)?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3c. Are any animals kept in alternative (nonprimary) areas for a substantial portion of each 24-hr period?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3d. Are any animals kept in alternative (nonprimary) areas for substantial portions of the year or season?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3e. Does each animal have access to primary environments (habitats) during their active periods (e.g., nocturnal animals in primary environments during the night)?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(Continued)

(Continued)

<i>Institution:</i>		<i>Date:</i>				<i>Not</i>	
<i>Individual/Environment:</i>		<i>Yes</i>	<i>Somewhat</i>	<i>No</i>	<i>N/A</i>	<i>Clear</i>	<i>Notes</i>
4.	Does each animal have the ability to choose where and with whom they spend their time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.	Does each animal have the ability to choose when they perform different behaviors (e.g., feeding, shifting)? Please describe in the Notes section the ways in which the animal(s) can exert control over aspects of their lives.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.	Do behind-the-scenes (nonprimary) holding areas provide adequate space and complexity for the time animals must be in them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7.	Is there a comprehensive program of maintaining environmental complexity (enrichment, changing environmental features, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8a.	Does it appear that social environments are appropriate in terms of number of animals, species, demographic composition (ages and sexes)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8b.	Does each animal have the ability to avoid habitat mates?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9a.	Does each animal have the ability to avoid being disturbed by other animals outside of the primary environment (habitat; e.g., local wild animals, animals in nearby habitats)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9b.	Does each animal have the ability to avoid being disturbed by guests?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9c.	Does each animal have the ability to avoid being disturbed by animal care activities (e.g., cleaning, facility maintenance, and repair activities, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10.	Are diets delivered in species-appropriate ways (content, texture, taste, and schedule)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11.	Is there an operant conditioning training program and what is it used for (e.g., veterinary, shows)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12.	How are keeper–animal relationships incorporated into welfare plans, and how are the impacts of these relationships on the welfare of animals evaluated?				<input type="checkbox"/>	<input type="checkbox"/>	
13a.	Do any of the animals demonstrate stereotypic behaviors? If yes, please note specific behavior in the Notes section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13b.	If yes, is there an understanding of what is causing the stereotypies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13c.	What are the measures in place to try to address them?				<input type="checkbox"/>	<input type="checkbox"/>	
14a.	Does each animal appear to be displaying a variety of species-appropriate behaviors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14b.	Are behavioral observations being conducted to better understand activity budgets for each animal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14c.	What is the feedback process in place to use the behavioral data to make any necessary modifications to the management of the individual animals?				<input type="checkbox"/>	<input type="checkbox"/>	
15.	Have any welfare concerns been reported for this individual or environment? If yes, please note each concern and outcome in the Notes section.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Notes Page: