

# Welfare Evaluations of Nonhuman Animals in Selected Zoos in the Philippines

Ronnel R. Almazan and Roberto P. Rubio

*University of the Philippines*

Govindasamy Agoramoorthy

*Tajen Institute of Technology*

This study evaluated 3 zoos in the Philippines: the Wildlife Rescue Center and Mini Zoo, Manila Zoological and Botanical Garden, and Cavite Botanical and Zoological Park to determine the standards of nonhuman animal welfare. The study measured and compared the cage sizes of various animals to the international minimum standards. According to the categories of management and husbandry, the 3 zoos showed a significant difference on the mean scores of ranking. The Wildlife Rescue Center and Mini Zoo ranked first, followed by Manila Zoo and Cavite Zoo. Although most cages in the 3 zoos followed acceptable minimum standards, the study identified several problems related to animal welfare, hygiene, husbandry, and management. Based on the evaluations, the study recommended that the 3 zoos improve animal welfare standards.

Two hundred zoos are known to exist in the Philippines and they display various species of animals—both endemic and exotic (Protected Areas & Wildlife Bureau, 2001). Several zoos in the Philippines have problems meeting acceptable minimum standards in terms of nonhuman animal welfare. Rescued and confiscated animals also end up in zoos, thereby adding to the problem of spatial, physical, nutritional, and welfare constraints. To understand the extent of the problems and to improve welfare standards significantly, it is necessary to evaluate the zoo's existing protocols on animal welfare.

Although zoo evaluations are being conducted in several Southeast Asian countries on behalf of the regional zoo association (Agoramoorthy, 2002, 2004; Agoramoorthy & Hsu, 2001b), no one has done any assessment of animal welfare in zoos in the Philippines. Therefore, this study was aimed at assessing animal welfare standards among three zoos in the Philippines. The objectives of the study were (a) to assess animal welfare problems quantitatively, (b) to evaluate the cage measurements of representative groups as compared to acceptable minimum standards, (c) to identify the issues and concerns related to animal welfare and management practices, and (d) to provide recommendations to zoos to improve animal welfare standards.

## METHOD

Between June and September 2003, three zoos were evaluated: the Wildlife Rescue Center and Mini Zoo, Manila Zoological and Botanical Garden, and Cavite Botanical and Zoological Park. Data on animal welfare were collected following the methods previously established by Agoramoorthy (2002, 2004) to evaluate zoos. Random selection was employed to choose zoo managers (Evaluators 1 to 10) and visitors (Evaluators 11 to 20) to join the team of evaluators. The evaluators were asked to fill out the forms and individually rate the preselected exhibits in the three zoos. A total of 120 evaluators (30 zoo staff and 90 visitors) participated in the data collection. At least one representative species in an exhibit was chosen randomly from each zoo for thorough assessment. In cases in which there was more than one exhibit of the selected species, the one with the oldest animal was considered—this was done through tracing the animal's history in captivity.

The evaluation form was adopted after Agoramoorthy (2002, 2004), following the five basic freedoms (Mench & Kreger, 1996; Spedding, 1993). Before the form was finalized, a pretest was done among a number of college students. The following categories were identified:

1. Sufficiency of food and water
2. Quality of veterinary care and living conditions
3. Animal safety
4. Sufficiency of cage size relevant to animal's size and number
5. Environmental and behavioral enrichment
6. Conditions of animals to exhibit normal behavior
7. Relevance and adequacy of conservation, finance, and welfare programs
8. Accuracy and availability of documentation and identification of the animals including signage, records, and reports
9. Efficiency of management practices

When recording data on each category, an evaluation point was given: (a) best, (b) good, (c) average, (d) poor, and (e) worst. Actual measurements determined cage sizes of representative animals, and the number of animals kept in the enclosure was noted. The data collected were used to compare the existing minimum standards (American Zoo and Aquarium Association, 1997) based on the comparison of floor area per individual. Statistical analyses were used by the SAS (2000) software. The effect of management of zoos and evaluators was tested using analysis of variance in General Linear Model at 5% level of significance to test the differences of mean scores of ranking of different management categories. The Duncan's Multiple Range Test was used as a pair-wise mean comparison test to determine significant variation in terms of the management applied among the three zoos (SAS, 2000).

## RESULTS

All three zoos obtained acceptable minimum standards, despite variations in each evaluator's response based on the mean average of all the rating (Table 1) and the comparison between means among the three zoos (Figure 1). The Wildlife Rescue Center and Mini Zoo received the highest points for Categories 1 through 9, followed by Manila Zoo and Cavite Zoo. The Rescue Center and Mini Zoo had acceptable management practices with an average score of 2.15 followed by Manila Zoo at 2.41 and Cavite Zoo at 2.59 (Tables 1 to 3).

TABLE 1  
Average Evaluation Scores for Various Management Practices in Three Zoos  
in the Philippines

Category	Name of Zoo		
	Rescue Center and Mini Average	Manila Average	Cavite Average
1	2.00	2.17	2.33
2	2.03	2.27	2.47
3	1.88	2.18	2.20
4	2.22	2.53	2.42
5	2.37	2.60	2.92
6	2.20	2.45	2.77
7	2.27	2.50	2.72
8	2.22	2.67	2.77
9	2.12	2.30	2.70
Average	2.15	2.41	2.59

*Note.* Categories 1 through 9 are described in the text. Based on scale ranging from 1 (*best*), 2 (*good*), 3 (*average*), 4 (*poor*) to 5 (*worst*).

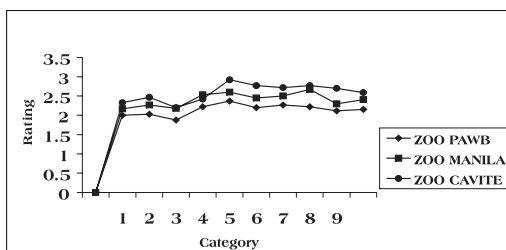


FIGURE 1 Graph of the average evaluation scores for various management practices for the three different zoos. Categories 1 through 9 are described in the text. Based on a scale ranging from 1 (*best*), 2 (*good*), 3 (*average*), 4 (*poor*), to 5 (*worst*).

TABLE 2  
Analysis of Variance for the Sources of Variation

Source of Variation	df	Sum of Squares	M Square	F Value	pr > F
Zoo	2	10.3291	5.1645	26.52*	< .0001
Evaluator (zoo)	57	78.8154	1.3827	7.10*	< .0001

\*Significant at 5% level of significance.

TABLE 3  
Duncan's Multiple Range Test for Zoos

Duncan Grouping <sup>a</sup>	M	Zoo
A	2.46111	Cavite
A	2.40733	Manila
B	2.14456	Mini

<sup>a</sup>Any two means having common letter(s) are not significantly different; otherwise, they are significantly different (at 5% level of significance using Duncan's Multiple Range Test).

There was significant difference between, and within, each zoo; the  $F$  value was at 26.52 for means between zoos and 7.10 for means within zoos ( $p < .0001$ ); both were at 5% level of significance. From the aforementioned results, there was a noticeable variation among evaluators' ratings on each zoo (Table 2). The Duncan's Multiple Range Test was used to compare overall mean between zoos (Table 3). Leading to the conclusion that it had the best-of-three management practice for captive animals, the Wildlife Rescue Center and Mini Zoo obtained the lowest mean score (2.14456), followed by Manila Zoo (2.40733) and Cavite Zoo (2.46111).

### Wildlife Rescue Center and Mini Zoo

The Protected Areas and Wildlife Bureau of the Department of Environment and Natural Resources is the leading government agency in the Philippines to promote nature conservation and sustainable use of biodiversity. One of the bureau's programs is the Wildlife Rescue Center started in 1970 and formerly known as Ninoy Aquino Park and Nature Center. It is located in Diliman, Quezon City and has an area of 24 ha with 18 staff including 2 veterinarians.

In general, all categories tackled in the evaluation obtained a rating of acceptable minimum standard. The zoo has medical and nutritional laboratories to solve problems related to disease and diet. In 2003, the facility maintained 970 animals during the month of June and 959 for the month of July.

Cage measurements were taken for animals that included Philippine brown deer, parrots, red-eared sliders, binturong, and green iguana. Based on the floor area per individual, the cage measurement exceeded the minimum requirement as much as 18.03 m<sup>2</sup> because the standard measurement was set at 40 m<sup>2</sup> for two individuals. Space was emphasized on a per individual basis and the recommended enclosure requirements were satisfied. The cage size in terms of floor per bird was 1.5 m<sup>2</sup>. Short of the minimum standard, in terms of height requirement, it exceeded the set standard by 9 m. Following the recommended cage sizes, the confinement was sufficient for about seven birds with due consideration for their sizes. The measured floor area for the lizards was short by as much as 3 m<sup>2</sup> and cage height was short by 0.2 m. The entire enclosure did not meet the acceptable minimum standard. The area was sufficient for housing only two individual lizards but several lizards were packed in the small cage.

### Animal Welfare Problems and Recommendation

Although the majority of the cages follow acceptable minimum standards, overcrowding was one of the biggest problems causing undue stress and uncomfort-

able spacing among animals. The center needs to implement stricter measures to develop a favorable environment for rehabilitation and reintroduction of animals because some animals appeared to have lost their feral nature or otherwise might have imprinted on human staff or visitors. This was evident in the case of talking birds, many of whom recently have learned to talk. In the quarantine section of the rescue center, animals either were overcrowded or kept in small cages. Therefore, the center needs more space with better enclosures for animals. The staff should pay careful attention to issues related to animal welfare. This should be a priority, accomplished with accuracy and consistency.

### Manila Zoological and Botanical Garden

The Manila Zoo with an area of 5.5 ha opened in July 1959 and is the oldest zoo in the Philippines. The zoo has a staff of 300 including 3 veterinarians, 30 keepers, and 20 food handlers. The zoo receives funds from the city government. In general, the different practices addressed in Categories 1 to 9 were of average standard. The zoo is equipped with facilities to care for all basic problems related to pain, disease, and injury.

Manila Zoo had a collection of 553 animals for the month of August 2003. Enclosures were measured for tigers, white-bellied sea eagles, and turtles. The depth of the tiger moat was short by half, but the width of the moat exceeded the standard for dry moats by 6 m. The whole enclosure was good enough in providing sufficient space for the animal, although a deeper moat is preferred. The suggested minimum area usually was for a group of 5 raptors, but it meets only half of the requirement at 24.2 m<sup>2</sup> for a group of 5 while exceeding the minimum height and width by 1 and 5.5 m, respectively. The whole cage could accommodate only a maximum of 12 individuals of mixed and compatible raptors. The number of turtles was too dense for the given enclosure, making all other considerations for measurements inapplicable. The whole enclosure was sufficient to house only six turtles, so the enclosure did not pass the minimum requirements in terms of the floor area for each individual turtle (Figure 2).

### Animal Welfare Problems and Recommendation

Most of the animals lacked environment and behavioral enrichment (Figure 3). The environment outside the enclosure was natural; enclosures inside looked pitiable with unnatural surroundings. Most animals also were kept individually, rather than with a companion or in a social group in larger enclosures with adequate enrichment devices.

The majority of the cages can house only 1 or 2 individuals according to international standard but they were observed to house 12 to 40 individuals in a stressful situation. Furthermore, poor hygienic conditions were noted in several cages;



FIGURE 2 Crowded turtles in poor hygienic condition in Manila Zoo.

therefore, cleanliness should be a priority both inside and outside enclosures. Environmental and behavioral enrichment for animals should receive a high priority. As soon as possible, staff must receive training in basic husbandry, veterinary care, and enrichment techniques.

### Cavite Botanical and Zoological Park

The Cavite zoo is a new facility, which started its operations in December 1997 at Barangay, Santa Cruz. The zoo has an area of 3,736 m<sup>2</sup>, thereby making it one of the smallest zoos in the Philippines. Supported by the local government, the zoo provides a natural habitat for animals. The zoo's staff of 10 includes a veterinarian. The animals displayed appeared to be in good health. In June 2003, the zoo had 168 animals; in July, the number decreased to 147. The cages measured included palm civets, cattle egrets, and reticulated pythons. In terms of the minimum standard required for caging, the area was sufficient to meet standards.

### Animal Welfare Problems and Recommendations

Although the cages were adequate in terms of size and space requirements, some animals did not have enough protection from visitors. Visitors interacted closely with animals, escalating the animals' stress levels. The zoo's hygienic conditions need



FIGURE 3 Enclosure showing a gibbon with no environmental and behavioral enrichment in Manila Zoo.

improvement. Lack of environmental and behavioral enrichment was evident in most of the enclosures; therefore, the need for trained keepers is urgent.

## DISCUSSION

In the zoos, evaluators' ratings varied noticeably; at least two zoos had significantly different category ratings at 5% level of confidence. Local evaluators when evaluating their own zoos were quick to give high scores, probably because they were unable to notice welfare problems. This is similar to a previous study of zoo evaluations in Thailand (Agoramoorthy & Harrison, 2002). To make the assessment procedure fair, efficient, and successful, the role of outside evaluators thus becomes critical (Agoramoorthy, 2002). Also, it is crucial to include local animal welfare specialists in the zoo evaluation team.

The Wildlife Center and Mini Zoo had the largest collection of animals, followed by Manila Zoo and Cavite Zoo. Although the cage measurements were of acceptable minimum standards, overcrowding in all three zoos apparently created distress to animals. Zoo managers must act quickly to relieve animal suffering in overcrowded enclosures.

Special attention also should be paid when designing enclosures and cages to accommodate an optimum number of animals: Overcrowding always should be avoided to prevent stress and discomfort to animals. Because a majority of the animals lived in overcrowded conditions in three zoos, there was an urgent need to provide the animals with another enclosure or facility where they could be comfortable and at ease. Almost all the enclosures lacked environmental and behavioral enrichment for animals. Following basic methods described by Markowitz (1982), immediately improving enrichment activities for animals in the zoo is vital.

Large numbers of endangered species still are being smuggled out of the Philippines for local and overseas trade (Agoramoorthy, 2003). Zoos must tackle carefully the problems related to rescuing and confiscating animals. There are rescue and rehabilitation centers available in Southeast Asian countries that provide temporary care for various species of animals (Agoramoorthy & Hsu, 2001a). This study also shows how a temporary rescue center, started in the 1970s, slowly turned into a permanent mini zoo. Zoos must refrain from becoming a long-term rescue center: Mainly because of the lack of space in holding areas and insufficient manpower to care for them, rescued and confiscated animals are known to bring down the quality of zoos (Agoramoorthy & Harrison, 2002). Zoos also could promote conservation by developing projects such as carefully releasing healthy animals, strictly following international guidelines, or breeding highly endangered species in captivity (International Union for the Conservation of Nature and Natural Resources, 1998, 2002).

Although zoos are accepted widely in today's society, there is a growing concern about the welfare of, and emphasis on, the ethics, dignity, and humane treatment of animals in the zoo (Regan, 1983; World Society for the Protection of Animals, 2002). When compared to Western zoos, zoos in the Philippines have yet to reach the international best standard. The concept of open, moated enclosures is recommended when local zoos build new enclosures or renovate old ones. There is nothing new about this. At the turn of the century, Carl Hagenbeck used this concept when he built his zoo near Hamburg, Germany (Kreger, 2001). In the Philippines, few zoos have followed suit on this notion. Zoo managers often fear the expense of demolishing existing structures and replacing them with concealed moats to contain animals. If zoos in the Philippines want to continue their business and make the zoo experience real for visitors, they must make sure they keep and display animals per professional standards with better design (Coe, 1985).

The zoo evaluation process outlined previously is consistent with the ongoing zoo evaluations conducted in the region on behalf of the Southeast Asian Zoos Association (Agoramoorthy, 2002, 2004). To understand the basic problems related to animal welfare, we adequately reviewed the management practices of zoos in the Philippines. Appropriate recommendations were given to zoo managers for improving standards of animal welfare. This method can be applied to assess animal welfare in other zoos in the Philippines.

## REFERENCES

- Agoramoorthy, G. (2002). Animal welfare and ethics evaluations in Southeast Asian zoos: Procedures and prospects. *Animal Welfare, 11*, 295–299.
- Agoramoorthy, G. (2003). Illegal trade of exotic pets. *Hemispheres, 3*, 36–39.
- Agoramoorthy, G. (2004). Ethics and welfare in Southeast Asian zoos. *Journal of Applied Animal Welfare Science, 7*, 189–195.
- Agoramoorthy, G., & Harrison, B. (2002). Ethics and animal welfare evaluations in Southeast Asian zoos: A case study of Thailand. *Journal of Applied Animal Welfare Science, 5*, 1–13.
- Agoramoorthy, G., & Hsu, M. J. (2001a). Rehabilitation and rescue center. In C. E. Bell (Ed.), *Encyclopedia of the world's zoos* (pp. 1052, 1053). London: Fitzroy Dearborn.
- Agoramoorthy, G., & Hsu, M. J. (2001b). South East Asian zoos association. In C. E. Bell (Ed.), *Encyclopedia of the world's zoos* (pp. 1164, 1165). London: Fitzroy Dearborn.
- American Zoo and Aquarium Association Publication. (1997). *AZA's minimum husbandry guidelines for mammals*. Bethesda, MD: Author.
- Coe, J. C. (1985). Design and perception: Making the zoo experience real. *Zoo Biology, 4*, 197–208.
- International Union for the Conservation of Nature and Natural Resources. (1998). IUCN guidelines for re-introduction. Cambridge, England: Author.
- International Union for the Conservation of Nature and Natural Resources. (2002). IUCN guidelines for the placement of confiscated animals. Gland, Switzerland: Author.
- Kreger, M. D. (2001). Hagenbeck, Carl, Jr. 1844–1913. German animal dealer and trainer, founder of Tierpark Hagenbeck. In C. E. Bell (Ed.), *Encyclopedia of the world's zoos* (pp. 535–537). London: Fitzroy Dearborn.
- Markowitz, H. (1982). *Behavioral enrichment in the zoo*. New York: Oxford University Press.
- Mench, J. A., & Kreger, M. D. (1996). Ethical and welfare issues associated with keeping wild mammals in captivity. In G. Kleiman, M. E. Allen, K. V. Thompson, & S. Lumpkin (Eds.), *Wild mammals in captivity: Principles and technique* (pp. 5–15). Chicago: University of Chicago Press.
- Protected Areas & Wildlife Bureau. (2001). *Statistics on Philippine protected areas and wildlife resources*. Quezon City, Philippines: Author.
- Regan, T. (1983). *The case for animal rights*. Berkeley: University of California Press.
- SAS Institute. (2000). SAS/ETS software: Changes and enhancements. Release 8.1 [Computer software]. Cary, NC: Author.
- Spedding, C. R. W. (1993). Animal welfare policy in Europe. *Journal of Agricultural and Environmental Ethics, 6*, 110–117.
- World Society for the Protection of Animals. (2002). *Caged cruelty: The detailed findings of an inquiry into animal welfare in Indonesian zoos*. London: Author.