

ANIMAL CARE AND MANAGEMENT AT THE NATIONAL ZOO: INTERIM REPORT

EXECUTIVE SUMMARY

The Smithsonian Institution's National Zoological Park (National Zoo) in Washington, D.C. hosts approximately two million visitors annually as a major tourist attraction. For families and children spending time in the nation's capital, the National Zoo is a place away from major museums that provides the opportunity to stroll and relax in a quiet setting. Consequently the National Zoo's well-being is not just a local concern but also one that resonates nationally. The prominence of the National Zoo on the national scene is additionally elevated as a result of Washington being an important media center for radio, television, and the press. The media's scrutiny of several animal deaths brought the National Zoo into the public consciousness and to the attention of Congress.

The National Zoo differs from other metropolitan zoos in that it receives much of its support from the federal taxpayer, a fact that is frequently unappreciated. As part of the Smithsonian Institution, whose museums and galleries were established "for the increase and diffusion of knowledge among men," the National Zoo is an institution in which the nation should be able to take pride. The U.S. House of Representatives Committee on House Administration (with oversight of the Smithsonian Institution) held a hearing on March 5, 2003, in which questions were raised regarding the quality of animal care and management at the National Zoo. It recommended a science-based review of the institution by the National Academies. In response to this request the Board on Agriculture and Natural Resources and the Institute for Laboratory Animal Research convened a committee and charged it to conduct a review of the care and management of animals at the National Zoo.



The Task of the Committee

A world-class zoo has missions that extend far beyond supplying attractive, humane venues for viewing wild animals in captivity. Zoos are complex organizations dedicated to conservation, education, and science with budgets derived from a mixture of sources. Except where these lesser-known aspects of the National Zoo impinged on animal care and management, they were not within the scope of this review. For example, the committee was not asked to review the education programs or the quality of the research carried out at the National Zoo or the scope or effectiveness of its conservation programs. Nor was the perceived adequacy (or inadequacy) of funding to support the various National Zoo activities within the committee's charge, although the utilization of these resources as it relates to animal care and management is within the charge. Instead, the committee was explicitly charged to focus narrowly, considering only those issues related specifically and directly to animal management, husbandry, health, and care.

THE INTERIM REPORT

Organization

The interim report is divided into five chapters. The first serves as an introduction providing facts about the National Zoo, including budgetary and personnel information. This information is provided as background material without interpretation, as these were not related to the charge of the committee. The next four chapters detail various aspects of the National Zoo that affect animal care and management at the Rock Creek Park facility. Each of these chapters is divided into four parts for each particular topic area: (1) an introduction that describes attributes of an exceptional zoo; (2) the current status of the National Zoo; (3) strengths and weakness of current practices at the National Zoo; and (4) findings and immediate needs for animal care and management at the National Zoo. In essence, the third part is the logical subtraction of part one from part two, the difference between the National Zoo today and an exceptional zoo leading to the findings and immediate needs. Where data have been available for the interim report, the committee has reported on the zoo in the context of the larger zoo community.

Criteria for Selecting Findings

The selection of findings that emerged from committee discussions relating to this interim report is based on the following criteria:

1. The immediacy of the threat to animal health and welfare,
2. The severity of the problem, or
3. The practicality of providing a quick solution to the problem in relation to present resources.

The committee relied heavily on published information on how zoos should operate, on input from experts, and on previous evaluations of the National Zoo from the American Zoo and Aquarium Association (AZA), the U.S. Department of Agriculture (USDA), and from the Smithsonian Institution itself. Committee members visited the Rock Creek Park and the Conservation and Research Center (CRC) campuses to view the facilities and to meet staff members, formally and informally. Committee members had open access to the entire National Zoo operation and had the opportunity to inspect the facilities much as the public views them, but also “behind the scenes” in areas where the public rarely visits. In addition, Smithsonian staff members were encouraged to submit information through NRC staff in such a manner that their identities could be protected. These impressions were discussed during committee deliberations, and lists of issues were identified. As a result several thousand pages of records and documents were requested from the National Zoo and were carefully reviewed by the committee. The committee decided which of the issues were most pressing at the Rock Creek Park facility and described them in this initial, interim report.

Based on observation and documentation the committee came to the opinion that the decline in the state of physical plant at the National Zoo had accrued over many years. The overarching questions were whether the visible deterioration was also reflected in the way that the animal collection was managed and in the quality of animal care and husbandry, and whether a pattern in animal deaths could be attributed to a breakdown in the authority of management, poor veterinary or nutritional care, or other types of issues.

The issues identified in this report are science-based and founded, at least in part, on lessons learned from the recent deaths of animals, mainly mammals, in the collection. Although the committee attempted to discern accurately the circumstances that led to many of the deaths, in some cases it was impossible either because the written record was incomplete or because there were conflicting accounts from involved National Zoo personnel. In any case, the charge of this committee was not to assign blame but to present recommendations that would avoid similar incidents occurring in the future. The committee has also noted that the National Zoo has been actively taking steps to correct some of the problems identified here and earlier by the AZA committee on accreditation and the inspection of the animal facilities by the USDA in the summer of 2003.

In the initial analysis of the most pressing needs for the National Zoo the committee has focused on issues identified at the Rock Creek Park facility. Some of these undoubtedly overlap with issues at the CRC (other issues at CRC be reviewed in detail in the final report). Four thematic areas of weaknesses became apparent to the committee: (1) animal care and management, (2) record keeping, (3) pest management, and (4) mission and strategic planning for the entire National Zoo complex. These issues are treated sequentially, although in the larger complexity of issues at the National Zoo they clearly overlap.

Findings and Immediate Needs

The National Zoo is one of 213 zoos and aquariums accredited by the AZA. During its last AZA inspection the National Zoo accreditation was extended for one year. This accreditation is scheduled to expire in March 2004. The CRC is one of 16 certified related facilities. The CRC was certified for five years during its last AZA inspection in March 2003. This CRC certification is scheduled to expire in March 2008.

The National Zoo has undergone downsizing in its animal collection, with a decline from a maximum of over 6,000 in 1995 to the 2,600 today. However the drop in the number of species represented in the collection has not declined comparably. The reasons for the decline in animal numbers can be attributable to a drop in acquisitions, a decision to transfer some animals or groups of animals, and mortality in the collection. One of the issues raised is whether mortality rates at the National Zoo fall within acceptable bounds. The National Zoo's mortality rate during the last decade (1993-2002) period was 10.5 percent; in recent years (2000-2002) the mortality rate has declined to approximately 7 percent. The fluctuation in the National Zoo's mortality rate is in part due to biological variation, changing nature of the animal collection (species represented and animal numbers within individual species), and aging of the animal collection. Readers should be aware that the mortality rates at a zoo, whose collection is usually made up of animals with life spans much shorter than those of humans, depend greatly upon the nature of the species it houses as well as the age and health of individual animals.

Responsibility of the health of the animals at the National Zoo resides with at least three of its departments, Animal Health, Pathology, and Animal Programs. Animal Health is responsible for the health of the animals in the collection through ensuring proper nutrition, preventive medicine, and health care. Its staff includes the veterinarians and veterinary hospital staff, and nutritionists. Pathology provides clinical laboratory and postmortem diagnosis as well as research on diseases afflicting a zoo collection. The Animal Programs Department is responsible for the exhibits, day-to-day care of the animals, and the development of the animal collection.

Animal Care and Management

***Finding 1:** The current preventive medicine program at the National Zoo is not being fully implemented, and since 1998, veterinary staff members have not been adhering to this program in terms of providing annual exams, vaccinations, and infectious-disease testing. Although efforts have been made in the past year to improve implementation, there is still a backlog of animals that have not received examinations, vaccinations, or tests as prescribed by the preventive medicine program.*

The Preventive Medicine Program includes quarantine, parasite surveillance, immunization, infectious diseases screening, dental prophylaxis, periodic reviews of diets, husbandry techniques, and vermin control. While the written documentation outlining the program is comprehensive and adequate, there has been poor adherence to the guidelines. Since 1998, the committee found numerous failures to provide timely vaccinations, tuberculosis tests, or physical or dental exams to primates, vaccinations and physical exams to carnivores, and vaccinations for avian species. One example is the case of the East African Bush elephant "Nancy," where the failure to administer an annual tuberculosis test resulted in the failure to diagnose an active case of tuberculosis.

During the past year the Department of Animal Health has taken steps to improve adherence with the preventive medicine program, but as of December, 2003 not all animals due to be examined/vaccinated/tested under the preventive medicine program had been treated. In addition, the department should learn to be

proactive with regard to emerging problems. For example, in light of the recent death of a colobus monkey from leptospirosis as well as the ongoing issue with rodent control at the National Zoo, routine vaccination against this disease (usually transmitted by the intake of feed or water contaminated with the urine of an infected animal, often a rodent) for animals at risk, should be reevaluated as a component of the preventive medicine program.

Immediate Needs: The Department of Animal Health should promptly eliminate the backlog of animals that should receive preventive care and document its current and future plan for preventive medicine activities. The National Zoo administration should take responsibility for ensuring that the Department of Animal Health has the resources and oversight necessary to adhere to the program.

***Finding 2:** Shortcomings exist in the animal nutrition program. There has been inadequate communication between the nutrition, keeper, and veterinary staffs; poor consultation between the research nutritionist and the acting head of clinical nutrition; and a lack of standardization and regular evaluation of animal diets. Nutrition records are not currently integrated with other record-keeping systems and, despite having adequate facilities for over a decade, the National Zoo is only now beginning to move toward a centralized commissary.*

Animal nutrition at the National Zoo is divided into two areas: research and clinical nutrition. The clinical nutrition division resides in the Animal Health Department, while the research nutrition division is located in the Department of Conservation Biology of the CRC. The National Zoo currently has a temporary acting head of clinical nutrition (on a two-year appointment) at Rock Creek Park and a research animal nutritionist in the Department of Conservation Biology of the CRC. Little direct interaction occurs between the acting head of clinical nutrition and the research nutritionist.

Lack of adequate nutrition oversight has contributed to animal deaths at the National Zoo. In the case of a zebra at Rock Creek Park in 2000 due to hypothermia and malnutrition, poor communication among keepers, nutritionists and veterinarians, poor record keeping, and a failure of adequate supervision of the health of the animals preceded the death. Nutrition management should take into account natural dietary habits and specific species recommendations. Diets should be analyzed for nutritional adequacy and records kept. Finally, after evaluation and formulation the diets should be appropriately implemented and the nutritional status of the animal monitored constantly by keepers and the veterinary staff. There were failures at many of these levels in the case of the zebra death.

The committee found that nutrition records are not integrated with medical, curatorial, keeper, and other records at the National Zoo. Additionally, there has been a lack of standard protocols for diets and for diet changes. Although the acting head of clinical nutrition built a database of currently fed diets, these are not yet complete. In addition, this staff member has recently been serving as the acting commissary manager (a new commissary manager was recently hired). With no dedicated clinical nutrition laboratory technician, only some routine nutrient analyses on feedstock are performed on zoo grounds. Lastly, the National Zoo has a decentralized commissary at the Rock Creek Park facility, with keeper kitchens for many of the animal enclosures and housing areas. More centralized diet processing could improve nutritional quality of diets, reduce food costs, and reduce pest problems. A 1992 external review requested by the National Zoo suggested the commissary had the physical capacity needed for the centralized program. A draft plan for developing a centralized commissary by 2005 has been developed by the National Zoo but the plan has not been finalized.

Immediate Needs: The National Zoo should immediately use its existing nutrition expertise by increasing coordination and collaboration between the acting head of clinical nutrition and the research nutritionist to address nutritional issues of the animal collection, including diet review, evaluation, and modification. The zoo also should seek a permanent (rather than temporary), qualified experienced person for the role of clinical nutritionist. Centralization of standard diet formulation records and integration of those records with other record-keeping systems for animal care and management at the National Zoo should be completed. An annual schedule for evaluation

of diet formulations for each animal or animal group should be developed and implemented. The National Zoo should finalize its draft plan to centralize the commissary and implement it in 2004.

***Finding 3:** There is a lack of documentation that the welfare of animals has been appropriately considered during the development and implementation of research programs and that complaints regarding the welfare of animals on exhibit were appropriately investigated. There also has been a lack of understanding within the National Zoo and the Smithsonian Institution of the requirements of federal regulations and Public Health Service Policy and how to maintain compliance.*

Since 1998, at least five research projects at the National Zoo that use animals have received Public Health Service (PHS) funding, which requires that the Smithsonian Institution provide a written Assurance acceptable to the NIH Office of Laboratory Animal Welfare (OLAW). Based on its review of records from the Smithsonian Institution Office of Sponsored Projects and the OLAW, the committee cannot confirm whether the Smithsonian Institution had a valid Assurance from 1997 to 2000, a time during which PHS-funded research projects utilizing animals were funded and conducted at the National Zoo. Records indicate that on April 11, 2000 the Smithsonian Institution submitted paperwork to the OLAW seeking to renew its Assurance. On February 19, 2004, the committee received a letter from the OLAW stating that the office recently located this submission and now considers the Smithsonian's Assurance to be approved for the period between April 11, 2000 and March 31, 2004. The committee did not have the opportunity to consider the implications of OLAW's letter in this interim report because it was received only a few days before the report was finalized. The status of the Smithsonian's Assurance will be examined more fully in the committee's final report.

In addition, based on documents provided to the committee, the Institutional Animal Care and Use Committee (IACUC) at the Rock Creek Park facility has not consistently fulfilled its responsibilities for conducting and reporting semiannual facilities inspections, program reviews, and documenting IACUC activities. At best, this committee functioned in an "off-and on-again" manner—e. g., it did not keep adequate records and minutes, and it did not monitor and certify the correction of deficiencies it had previously noted. Because of a lack of record keeping, the committee cannot discern if PHS-funded research conducted at the Rock Creek Park facility was being conducted in accordance with provisions detailed in the Guide for the Care and Use of Laboratory Animals, again mandated by PHS Policy.

It is possible that some PHS-funded research at the National Zoo, as well as some research involving nonhuman primates is subject to the Animal Welfare Act (AWA). However, due to the lack of documentation from the Smithsonian Institution and the National Zoo, the committee was unable to discern whether this research was subject to the AWA or whether it was being conducted in accordance with the standards outlined by the AWA. Further investigation of ongoing research at the National Zoo is warranted to determine if AWA-subject research is occurring.

Although not required by any regulation, the National Zoo did have a committee (previously designated the Animal Welfare Committee and most recently called the Rock Creek Park IACUC) tasked with addressing issues pertaining to the welfare of animals on exhibit and research animals not covered by PHS Policy or the AWA. However, this committee failed to keep acceptable records of its deliberations and activities, and it appears that the committee members saw their mandate as one of solving conflicts between staff members and not of acting as an advocate for the animals. In September 2003 (General Memorandum 15) the National Zoo outlined a new IACUC program, which will be evaluated in the National Academies' final report. Nevertheless, based on the failures of the previous system, the committee believes that the current staff at the National Zoo should receive training to implement the program adequately.

Immediate Needs: The National Zoo and the Smithsonian Institution should ensure compliance with all elements of the Animal Welfare Act and the Public Health Service Policy. The National Zoo and the Smithsonian Institution should seek outside training and assistance to achieve compliance with regulations and implement procedures meant to ensure the welfare of research and exhibit animals at the National Zoo.

Finding 4: *There has been poor adherence to the National Zoo's own policies and procedures for animal health and welfare.*

There has been a longstanding failure of staff to abide by National Zoo policy and procedures. In some cases these failures endanger the safety of the animal collection. These incidents include failure to obtain the appropriate sign-off on nutrition and euthanasia forms, failure to document changes in animal management appropriately, failure to adhere with quarantine procedures, and failure to act in accordance with IACUC protocols (see Finding 3).

The National Zoo's euthanasia policy requires that a euthanasia form be signed by the veterinarian performing the euthanasia, the responsible curator, and the supervisory veterinarian. The case of the bobcat provides an excellent example of where the decision to euthanize was made in a consensual manner with proper documentation. On the other hand, there have been several examples of failures to observe these guidelines (e.g. for the tree kangaroo and the orangutan euthanasia forms). Although there is no indication that these failures led to unnecessary suffering by the animals, proper procedures would have clarified the circumstances surrounding the decisions to euthanize, which in some cases have been clouded with controversy.

The purpose of quarantine procedures and protocols is to prevent the introduction of new pathogens into the collection. Procedures may have been violated when staff-owned pets were brought onto National Zoo grounds for veterinary examinations and care. Even as a professional courtesy, bringing pets into the Zoo represents a potential risk to the zoo collection and a violation of the zoo's own policies and procedures.

Immediate Needs: All levels of management should be held accountable for ensuring that National Zoo policies and procedures are followed. All zoo staff should take personal responsibility for educating themselves and adhering with the policies and procedures that pertain to their position and duties.

Record Keeping

Finding 5: *The National Zoological Park lacks a comprehensive information management system for animal husbandry and management records, which results in inconsistent record keeping and practices of alteration in medical records weeks or years after events. While some issues are being addressed (e.g., an electronic keeper log system is in development) these are stop-gap measures often having no concrete timeframe for completion or implementation.*

Adequate and accurate record keeping underpins animal health and welfare. The adequacy of the record keeping at the National Zoo varied greatly across the different units and departments, with a lack of standardized practices for reporting and archiving records. Patterns of inconsistent record keeping and archiving were found in keeper logs, curator reports, nutritionist records, and medical records. One example pertained to the bobcat "Phoenix" for whom 16 weeks of requested keeper records were lost. In addition to poor record keeping, the logs throughout the Animal Programs Department were often archived improperly and many, like those for the bobcat, were irretrievable. Currently each of the eight units is responsible for archiving its own keeper records, but there is no stated expectation of how long they should be kept. No individual within the National Zoo has overall responsibility for documenting or overseeing where keeper records are archived and how they are organized. This fragile knowledge base is particularly compromised at a time of staff turnover.

There were instances of veterinary staff records being altered weeks and even years after the event. The standard practice of editing original clinical notes is unacceptable. The committee does not intend to discourage the National Zoo from using the MedARKS system as a teaching or record-keeping tool, but advises that if erroneous entries are made or pertinent facts identified later, they should be corrected by addenda and not by altering the original entry.

Overall, the National Zoo has been handicapped in its efforts to provide adequate animal care by a nonfunctional information management system. Records should provide an accurate account of situations and practices relating directly to animal management and health. They should permit reconstruction of

events in the recent and distant past and should provide a rational basis for decision making. Ideally, a single, comprehensive electronic record-keeping system should be implemented, but the National Zoo may be obliged to use mixed paper and electronic records as a stop-gap measure.

Immediate Needs: The National Zoo should implement an information management system that ensures complete documentation of animal husbandry and management and reasonable accessibility to the records by all units and departments. This does not necessarily mean that the entire system needs to be computerized immediately but rather that consistent practices be put in place, that a system be developed to make the records reasonably accessible, and that an appropriately experienced individual be given responsibility for system oversight.

Pest Management

***Finding 6:** Even though the pest management program has been reorganized and is showing signs of improvement, pest management remains inadequate and poses a potential threat to the animal collection, employees, and visitors to the National Zoo.*

On January 10, 2003, measures to control rats in the red panda enclosure went awry because the National Zoo's own written protocols for approval of chemical use in animal enclosures were not followed. After the red panda deaths, responsibility for the Pest Management Program was transferred to the Pathology Department, and an Integrated Pest Management (IPM) Committee was formed to address the animal and insect pest problem at the zoo. Additionally, the National Zoo began the process of establishing a comprehensive program to address the widespread pest problem, including creation of a pesticide program manager position, which was subsequently filled. Despite many positive efforts by the new IPM Committee, housekeeping and site conditions remain poor throughout the Rock Creek Park facility. Rats and mice are present in animal areas and can be observed crossing public walkways in daylight. These conditions may have been exacerbated by the decision to reduce chemical control for rodents following the panda deaths. Considerable work will be required to ensure animal health and the aesthetic quality of the Rock Creek Park.

Immediate Needs: A comprehensive IPM plan should be developed: (1) in the short term to bring current populations of pests down to acceptable levels and (2) in the long term to maintain those levels using modern IPM techniques.

Mission and Strategic Planning

***Finding 7:** The National Zoo is operating without a strategic plan, which jeopardizes its long-term operations and focused use of the zoo's resources. An integrated plan for the entire institution incorporating the 10-year facility revitalization and animal collections plans has not been developed.*

The National Zoo currently operates without a strategic plan despite the recommendations of previous AZA accreditation reports. It does have an animal collections plan and a 10-year facility revitalization plan in place, but these are not substitutes for a comprehensive planning process that takes into account all aspects of the zoo's operational structure. A strategic planning process was recently initiated as part of a Smithsonian-wide program and is a positive step forward.

An issue to be addressed during the strategic planning process is an evaluation of mission and goals. One challenge for the National Zoo is to maintain alignment with the Smithsonian Institution's mission while identifying and implementing a strategy that will enable its own independent success. Generating a plan that ensures maximum use of current resources will be important. Current and proposed projects, such as the Asia Trail and Farm, should be evaluated as to their fit with the plan.

The National Zoo will need to engage in strategic resource planning (i.e., human resources, facilities) to support its mission. The capability of the National Zoo to engage in resource planning is limited because many resource decisions, such as the recent one to reduce staffing through buyouts across all its units, are made at the Smithsonian level. Such a practice raises issues about the extent to which the National Zoo will lose experienced staff and the capability of the National Zoo to make strategic staffing decisions.

Immediate Needs: The National Zoo should develop a comprehensive strategic plan and provide integrated goals for all aspects of the institution, with operational goals and performance measures, as soon as possible.

Moving Forward

While zoos have expanded their general mission over time from simply being exhibition facilities to becoming organizations that address conservation through research and education, their first and foremost responsibility is the health, nutrition, and welfare of the animals they maintain. The findings and immediate needs of the National Zoo outlined in this interim report are focused on correcting clear deficiencies and on enhancing animal care and management. The committee recognizes that some of the problems identified at the National Zoo are unique to the zoo, but many problems are common among other zoos. Situations and practices that negatively impact animal care and management, regardless of how common, are unacceptable at any institution housing captive live animals. The committee believes that the National Zoo should work quickly and diligently to address the problems identified in this report and to ultimately become a leader in effecting science-based change and improvement in the nation's zoo community.

THE FINAL REPORT

This interim report presents seven findings in four areas relating to animal care and management, record keeping, and pest management at the Rock Creek Park facility and strategic planning at the entire National Zoo complex. These findings and immediate needs should be considered by the National Zoo immediately because each threatens the well-being of the animals in the collection. The final report will expand on these four issues, particularly those that might be clarified as new information emerges. For example, as strategic planning proceeds the committee will be interested in how the National Zoo envisages its future and how it plans to organize its collection and its two campuses to reflect that vision. The committee will examine in detail any plans developed by the National Zoo to address issues raised in this interim report. In addition to expanding on the above four issues, the committee will also present issues that it did not consider so pressing that immediate steps had to be taken to implement change. Among these the committee has considered and may consider for the final report are management at the National Zoo, personnel health and safety issues, and formal training programs for staff, as they relate to animal care and management. A detailed analysis of other strengths and weaknesses in animal care and management at the CRC will be included in the final report. The final report is anticipated to be released during the second quarter of 2004.

Committee on a Review of Smithsonian Institution's National Zoological Park: R. Michael Roberts (*Chair*), University of Missouri, Columbia, **Joseph W. Alexander**, Oklahoma State University, Stillwater, **Bradford S. Bell**, Cornell University, Ithaca, New York, **Kurt Benirschke**, University of California, San Diego, **Janet Brannian**, University of Sioux Falls, Sioux Falls, South Dakota, **Charles Capen**, Ohio State University, Columbus, **Rhetaugh Graves Dumas**, University of Michigan, Ann Arbor, **Lester Fisher**, Chicago, Illinois, **Harold F. Hintz**, Cornell University, Ithaca, New York, **Paul W. Johnson**, Oneota Slopes Farm, Decorah, Iowa, **Maxim Kiefer**, Centers for Disease Control, Atlanta, Georgia, **Rebecca Remillard**, MSPCA Angell Animal Medical Center, Boston, Massachusetts, **Bernard A. Schwetz**, Department of Health and Human Services, Rockville, Maryland, **Thomas Yuill**, University of Wisconsin, Gaylord Nelson Institute for Environmental Studies, Mapleton, Utah, **Stephen L. Zawistowski**, American Society for Prevention of Cruelty to Animals, New York, New York, **Jamie Jonker** (*Study Director*), Board on Agriculture and Natural Resources.

For more information, contact the Board on Agriculture and Natural Resources at (202) 334-3062. *Animal Care and Management at the National Zoo: Interim Report* is available from the National Academies Press, 500 Fifth Street, NW, Washington, DC 20001; 800-624-6242 or 202-334-3313 (in the Washington area); www.nap.edu.

Permission granted to reproduce this brief in its entirety with no additions or alterations.