



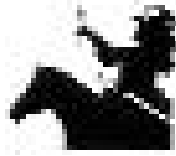
THE INDIAN ZOO INQUIRY

A REVIEW OF CONDITIONS IN THE ZOOS OF INDIA

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*A Review of Conditions in
the Zoos of India*

Compassionate Crusaders Trust
&
Zoocheck Canada
2004 (Revised 2006)



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for conducting this study and for their considerable efforts on behalf
of captive wild animals in India.

INTRODUCTORY REMARKS

COMPASSIONATE CRUSADERS TRUST

The Compassionate Crusaders Trust (CCT), formed in November 1993, started a signature campaign against zoos in 1996, contacting other non-governmental organizations (NGOs) and collecting a thousand signatures each year to send to the Central Zoo Authority at Delhi, giving concrete suggestions for improvement. Since these were ignored, CCT campaigned outside the zoo, distributing leaflets and pleading with the general public to add their voice against the cruel “Life Imprisonment, with no Court of Appeal”. A protest was held on 26th January, 1998, which is Republic Day. Entry to the zoo is free and 100,000 visitors enter each year. The reaction from the zoo authorities was such that police protection was needed for the protesters to continue distributing leaflets.

The CCT works in tandem with the People for Animals Calcutta (PFAC). Their Chairperson is Mrs. Maneka Gandhi. In late 1998, a Public Interest Litigation was filed at the Calcutta High Court, under the aegis of PFAC, against the way the birds and other animals were kept at the Calcutta Zoo. Ms. Usha Doshi, advocate and animal lover, gave her services free of charge. The Petition was accepted and is probably the first and only such case in the world, in which an NGO has sued a government operated zoo.

Subsequent to the appeal, the zoo authorities began to develop open air enclosures and procure companion animals. For the first time in the history of the hundred plus year old Calcutta Zoo, the shackles of the elephants were removed.

People for the Ethical Treatment of Animals (PETA) India contacted the CCT founder and Managing Trustee of PFAC for guidance to bring similar relief to the elephants in the Mumbai Zoo.

We commend the efforts of Shubhobroto Ghosh, the coordinator of the Indian Zoo Inquiry project, who joined the Compassionate Crusaders Trust (CCT) as a volunteer in 1994, while still at school. His innate interest in wildlife conservation was fanned by the ideology of the CCT and their campaign against zoos which started in 1996. Shubhobroto’s interest and enterprise lead him to read and surf the internet voraciously, until he found Zoocheck Canada. After contacting them and indicating an interest in pursuing a “zoo project” in India, their response was immediate and encouraging. Although he had his expenses reimbursed by Zoocheck Canada, he worked on his own without a salary.

CCT would like to suggest that present zoo infrastructures be modified and equipped with audio-visual centers that will educate the public through films, such as those seen on Animal Planet and National Geographic, as well as recorded celebrity statements explaining to the public just why zoos should not be encouraged. This should help develop a greater sensitivity and awareness about animal welfare in members of the public, who we hope will gradually begin to think about and oppose all forms of animal exploitation. We must not stick only to the zoo issue, but use every opportunity and facility to promote ethical attitudes in the widest possible circle at different levels of society all over the world.

So this project started a new chapter in the history of the movement against the outdated, cruel concept of caged zoos, and with ever-increasing global awareness, CCT hopes that caged zoos will – within the next decade or so – become a thing of the past.

ZOOCHECK CANADA

Over the past two decades, a dramatic increase in our understanding of wild animal biology and behavior has occurred. This understanding has prompted an intensifying concern about the welfare of wildlife held in captivity and a gradual shift in thinking about the ethics of keeping animals captive. The very existence of zoos, their role in conservation, education and the preservation of endangered species through captive breeding is now being questioned with surprising regularity throughout the world.

Almost all zoos, regardless of quality, claim to be educating the public and conserving wildlife. But the educational efforts of many zoos are nothing more than informational cage signboards and most have little or no meaningful involvement in legitimate, in-situ conservation initiatives.

In actual fact, many of today's zoos have changed little from their 19th century predecessors. They remain essentially menagerie-style collections of animals constituted to satisfy public curiosity and a desire to view wild animals up close. Many of them cause considerable physical and psychological animal suffering and are in desperate need of improvement.

In 2001, a university student named Shubhobroto Ghosh contacted Zoocheck Canada to solicit support for a review of conditions in India's zoos. From 1997 until 1999 Ghosh had been filming zoo conditions in northeast India for a UK-based animal welfare organization. His experiences examining zoos convinced him that the majority were deficient and required improvement; that many needed to be closed; and that a more comprehensive review of basic animal housing and husbandry conditions - an Indian zoo inquiry - was necessary as a first step on the road to improving the lot of zoo animals in India. Zoocheck Canada agreed.

In 2006, India has 159 recognized zoological parks, but some experts believe the actual number of zoos and zoo-type facilities to be between 350 and 500. Regardless of what the actual number really is, there is little doubt that the number of zoos in India is substantial and that they house tens of thousands of individual animals.

In June 2001 Shubhobroto Ghosh and his colleague Sanjib Sasmal began visiting zoos throughout India.

Their intent was to visit a representative sample of Indian zoos and to record the conditions they encountered through written notes, photographs and video. In total, 26 zoos were visited over a two year period.

Ghosh and Sasmal focused their attention on the basic aspects of animal housing and care (e.g., enclosure shape, size, substrate type, shelter, furnishings, number of animals, etc.) that are usually observable by any zoo visitor. They also provide commentary on their observations and, in some cases, recommendations for improvement.

The results of this study clearly indicate that many of India's zoos need substantial improvement and that, in some cases, individual facilities should be closed and their animals dispersed to more acceptable accommodation elsewhere.

Attitudes about wildlife and the keeping of wild animals in captivity are changing throughout the world. Increasingly, informed people agree that when wild animals are kept in captivity, their biological and behavioural well-being must be the highest priority. They also believe that zoos must serve a larger purpose than merely displaying animals for public amusement.

With these attitudinal changes has come increasing media coverage of zoo animal problems. There were many alarming stories in the media in 2005. In January 2006, media reported on a stampede of blackbuck at the Mumbai Zoo that resulted in the death of 13 animals.

Most of the visits that these reports are based on are now several years old. However, subsequent visits by the investigators, as well as by representatives of Zoocheck Canada, Compassionate Crusaders Trust and other animal welfare organizations clearly indicate that many of the problems outlined from previous years still exist in 2006.

Although there are critical elements in the Indian Zoo Inquiry report, we hope it will stimulate thoughtful discussion about how to improve standards of animal housing and care, and that it will facilitate a reexamination of laws and regulations governing the operation of all zoos in India. We remain optimistic that the problems faced by zoo animals in India can be resolved with the proper time, effort and resources.

ZOO LEGISLATION IN INDIA

CENTRAL ZOO AUTHORITY

Indian zoos are controlled by an autonomous agency called the Central Zoo Authority (CZA) which was constituted under the Wild Life (Protection) Act in 1992. The mandate of the CZA is to assist India's national effort to conserve wildlife. Standards for the housing and management of animals in zoos are laid out in the Recognition of Zoo Rules, 1992.

All Indian zoos are required to be officially recognized by the CZA. Recognition involves an evaluation by the CZA to determine whether or not each zoo meets CZA standards for animal housing and management.

According to the CZA website, the authority's role is more facilitation than regulation, so the authority provides technical and financial assistance to zoos that have the ability to achieve the desired standard. For those that are consistently unable to meet CZA standards are required to close.

The CZA also regulates the trade of wildlife recognized as endangered.

NATIONAL ZOO LEGISLATION

Below are excerpts from India's National Zoo Legislation and the Recognition of Zoo Rules 1992.

1.6 In India, many well designed zoos were set up in some of the States but for the most part, zoos have not been able to meet the challenges imposed by the changing scenario and still continue with the legacy of past i.e. displaying animals to the animals nor educative and rewarding to the visitors.

2.1.1 Supporting the conservation of endangered species by giving species, which have no chance of

survival in wild, a last chance of survival through coordinated breeding under ex-situ condition and raise stocks for rehabilitating them in wild as and when it is appropriate and desirable.

2.1.4 Besides the aforesaid objectives, the zoos shall continue to function as rescue centres for orphaned wild animals, subject to the availability of appropriate housing and upkeep infrastructure.

3.1.1 Since zoos require a significant amount of resources in the form of land, water, energy and money, no new zoo shall be set up unless a sustained supply of resources including finance and technical support are guaranteed.

3.1.3 Every Zoo shall maintain a healthy, hygienic and natural environment in the zoo.

3.1.6 Every zoo shall endeavour to avoid keeping single animals of non-viable sex ratios of any species. They shall cooperate in pooling such animals into genetically, demographically and socially viable groups at zoos identified for the purpose.

3.1.7 Zoos shall avoid keeping surplus animals of prolifically breeding species and if required, appropriate population control measures shall be adopted.

3.2.1 Except for obtaining founder animals for approved breeding programme and infusion of new blood inbred groups, no zoo shall collect animals from the wild.

3.2.2 Zoos shall not enter into any transaction involving violation of the law and provisions of international conventions on wildlife conservation

3.2.3 Zoos shall not enter into any transaction in respect of their surplus animals with any commercial

establishment. Even the animal products should not be utilised for commercial purposes. The trophies of the animals could, however, be used for educational or scientific purposes.

3.3.1 Every animal in a zoo shall be provided housing, upkeep and health care that can ensure a quality of life and longevity.

3.3.2 The enclosure for all the species displayed or kept in a zoo shall be of such size that all animals get adequate space for free movement and exercise and no animal is unduly dominated or harassed by any other animal.

3.3.3 Each animal enclosure in a zoo shall have appropriate shelters, perches, withdrawal areas, wallow, pools drinking water points and such other facilities which can provide the animals a chance to display the wide range of their natural behaviour as well as protect them from extremes of climate.

3.4.1 Zoos shall provide diet to each species, which is similar to its feed in nature. Where for unavoidable reasons any ingredients have to be substituted, due care will be taken to ensure that the substitute fulfills the nutritional requirement of the species.

3.4.2 For the well being of the animals, round the clock supply of portable drinking water shall be made available to all animals kept in the zoo.

3.4.3 With the objectives of avoiding human imprinting and domestication of animals, zoos shall prevent physical handling of animals by the staff to the extent possible.

3.4.4 Zoos shall not allow any animal to be provoked for tortured for the purpose of extracting any performance or tricks for the benefit of the visitors or for any other reason.

3.5.1 Zoos shall ensure availability of the highest standards of veterinary care to all the animals in their collection.

3.5.2 Adequate measures shall be taken by every zoo for implementing wildlife health and quarantine rules and regulations. Appropriate vaccination programmes shall also be taken up for safeguarding against infectious diseases. Timely action to isolate infected animals from the zoo population shall be taken to avoid further spread of disease.

3.6.3 Zoos shall also endeavor for dissemination of information on scientific aspects of management through publication of periodicals, journals, newsletters and special bulletins. Help of non-governmental organisations (NGOs) and government institutions shall also be availed in such efforts.

3.7.8 Special efforts shall be made to avoid human imprinting of the stocks raised for reintroduction purposes by providing off exhibit breeding facilities.

3.8.2 The central theme of the zoo education programme being the linkage between the survival of various species and protection of their natural habitat, enclosures which allow the animals to display natural behaviour are crucial to zoo education. Zoo shall, therefore, display animals in such enclosures only where the animals do not suffer physiological and psychological restraint.

3.8.4 Beside signage, the zoos shall also use guided tours, talks by knowledgeable persons and audio-visual shows for effectively communicating the message for conservation to the visitors.

3.10.2 Zoos shall not provide any infrastructure for recreation/entertainment of visitors that is inconsistent with the stated objective of zoos.

RECOGNITION OF ZOO RULES 1992

Section 63 of the Wild Life (Protection) Act 1972 (53 of 1972), the Central Government hereby makes the following rules:

General

- (1) The primary objective of operating any zoo shall be the conservation of wildlife and no zoo shall take up any activity that is inconsistent with the objective.
- (3) No zoo shall allow any animal to be subjected to the cruelties as defined under the Prevention of Cruelty to Animals Act, 1960 (59 of 1960) or permit any activity that exposes the animals to unnecessary pain, stress or provocation, including use of animals for performing purposes. Please visit:
<http://www.indialawinfo.com/bareacts/pca.html> for 1960.

- (5) No zoo shall keep any animal chained or tethered unless doing so is essential for its own well being.
- (6) No zoo shall exhibit any animal that is seriously sick, injured or infirm.
- (7) Each zoo shall be closed to visitors at least once a week.

Animal Enclosures - Design, Dimensions and other Essential Features

- (15) All animal enclosures in a zoo shall be so designed as to fully ensure the safety of animals, caretakers and the visitors. Stand of barriers and adequate warning signs shall be provided for keeping the visitors at a safe distance from the animals.
- (16) All animal enclosures in a zoo shall be so designed as to meet the full biological requirements of the animals housed therein. The enclosures shall be of such size as to ensure that the animals get space for their free movement and exercise and the animals within herds and groups are not unduly dominated by individuals. The zoo operators shall take adequate safeguards to avoid the animals being unnaturally provoked for the benefit of viewing by public and excessive stress being caused by visibility of the animals in the adjoining enclosures.
- (18) The enclosures housing the endangered mammalian species, mentioned in Appendix I to these rules, shall have feeding and retiring cubicles/cell of minimum dimensions given in the said appendix. Each cubicle/cell shall have resting, feeding, drinking water and exercising facilities, according to the biological needs of the species. Proper ventilation and lighting for the comfort and well being of animals shall be provided in each cell /cubicle /enclosure.
- (19) Proper arrangement of drainage of excess of water and arrangements for removal of excreta and residual water from each cell /cubicle /enclosure shall be made.

Hygiene, Feeding and Upkeep

- (22) Every Zoo shall provide for a proper waste disposal system for treating both the solid and liquid wastes generated in the zoos.
- (23) All left over food items, animal excreta and rubbish shall be removed from each enclosure regularly and

disposed of in a manner congenial to the general cleanliness of the zoo.

- (24) The zoo operators shall make available round the clock supply of potable water for drinking purposes in each cell /enclosure /cubicle.
- (25) Periodic application of disinfectants in each enclosure shall be made according to the directions of the authorised veterinary officer of the zoo.

Animal Care, Health and Treatment

- (26) The animals shall be handled only by the staff having experience and training in handling the individual animals. Every care shall be taken to avoid discomfort, behavioural stress or physical harm to any animal.
- (27) The condition and health of all animals in the zoo shall be checked every day by the person in-charge of their care. If any animal is found sick, injured, or unduly stressed the matter shall be reported to the veterinary officer for providing treatment expeditiously.
- (28) Routine examinations including parasite checks shall be carried out regularly and preventive medicines including vaccination shall be administered at such intervals as may be decided by the authorized veterinary officers.

Veterinary Facilities

- (32) Each veterinary hospital shall have facilities for restraining and handling sick animals including tranquilizing equipment and syringe projector.
- (33) The small and mini zoos, where full-fledged veterinary hospital is not available, shall have at least a treatment room in the premises of the zoo where routine examination of animals can be undertaken and immediate treatment can be provided.
- (34) Every zoo shall have a post-mortem room. Any animal that dies in a zoo shall be subjected to a detailed post-mortem. and the findings recorded and maintained for a period of at least six years.

Breeding of Animals

- (37) Every zoo shall keep the animals in viable, social groups. No animal will be kept without a mate for a period exceeding one year unless there is a legitimate reason for doing so or if the animal has already passed

its prime and is of no use for breeding purposes. In the event of a zoo failing to find a mate for any single animal within this period, the animal shall be shifted to some other place according to the directions of the Central Zoo Authority.

- (38) No zoo shall be allowed to acquire a single animal of any variety except when doing so is essential either for finding a mate for the single animal housed in the said zoo or for exchange of blood in a captive breeding group.
- (40) To safeguard against uncontrolled growth in the population of prolifically breeding animals, every zoo shall implement appropriate population control measures like separation of sexes, sterilization, vasectomy, tubectomy and implanting of pallets etc.
- (41) No zoo shall permit hybridization either between different species of animals or different races of the same species of animals.

Maintenance of Records and Submission of Inventory to the Central Zoo Authority

- (44) Every zoo shall publish an annual report of the activities of the zoo in respect of each financial year. The copy of the said annual report shall be made available to the Central Zoo Authority, within two months, after the end of the financial year. The report shall also be made available to the general public at a reasonable cost.

Education and Research

- (45) Every enclosure in a zoo shall bear a sign board displaying scientific information regarding the animals exhibited in it.
- (46) Every zoo shall publish leaflets, brochures and guide-books and make the same available to the visitors, either free of cost or at a reasonable price.

Visitor Facilities

- (49) First-aid equipment including anti-venom shall be readily available in the premises of the zoo.

ANIMAL WELFARE AND ZOO CONDITIONS

THE 'FIVE FREEDOMS'

The 'Five Freedoms' provide a useful construct for the evaluation of animal welfare in a wide variety of situations.

The 'Five Freedoms' are:

1. Freedom from thirst, hunger and malnutrition through ready access to fresh water and a diet to maintain full health and vigour.

This is a basic need of all animals in captivity that should involve consideration of the type of food provided, the frequency and method of presentation, as well as its nutritive quality. The provision of both food and water should take into account the animals' species-specific requirements.

2. Freedom from thermal and physical discomfort by providing an appropriate environment including shelter and a comfortable resting area.

Addressing this freedom requires consideration of several factors including, but not limited to, shelter from inclement weather conditions (i.e., rain, snow, wind); the provision of cool, shady areas and warm, sunny areas as needed; the provision of substrates of appropriate type and depth for animals that dig or burrow; the provision of trees, climbing apparatus and other materials that allow utilization of vertical space for animals that climb or fly.

3. Freedom from pain, injury and disease by prevention or rapid diagnosis and treatment.

Factors to consider in addressing this freedom include enclosure design; the provision of suitable furnishings; adequate space and appropriate social groupings to prevent inter-animal conflict, and appropriate sanitation, diet, and veterinary care to prevent or treat injury and disease.

4. Freedom to express normal behaviour by providing sufficient space, proper facilities and company of the animal's own kind.

This fourth 'freedom' is integral to the health and well-being of captive wild animals, as well as for achieving the interpretive goals of zoos, wildlife parks and other facilities. All captive animals must be able to engage in a significant portion of their natural behavioural regimes. They should be given an opportunity for choice and control, thereby allowing them to make a meaningful contribution to the quality of their own lives.

5. Freedom from fear and distress by ensuring conditions and treatment that avoid mental suffering.

This 'freedom' includes not only fear and distress caused by physical injury or intimidation from conspecifics due to overcrowding or abnormal social groupings, but also to threats from outside predators and pests. Frustration and boredom must also be addressed, as well as other kinds of chronic stressors, such as problematic auditory, olfactory and visual stimuli.

The 'Five Freedoms' are a useful assessment framework for inspections of zoos and other captive wildlife facilities.

Regardless of what kind of zoological facility is being assessed or what methodology is being used, it is important that the assessor understand what animal welfare is and that they possess a basic understanding of captive wildlife husbandry principles.

ANIMAL WELFARE

Knowledge of the biology and behaviour of wild animals has increased exponentially during the past several decades. In some cases, this has facilitated a change in captive wild animal husbandry and housing practices. The antiquated notion that animals should live their lives according to pre-arranged schedules in sterile, easy-to-clean surroundings is slowly being rejected. In fact, most reputable professionals now recognize that “total institutionalized care” in which animals have no ability to make a meaningful contribution to the quality of their own lives is detrimental to animal well-being. This is particularly important concept to consider when assessing the welfare of wildlife in captivity.

Animal welfare involves more than just the satisfaction of physical needs or the absence of physical injury or disease. While physical functions and overall condition are an important aspect of welfare, an animal’s welfare can be poor in the absence of obvious physical problems. For example, if an animal is frightened, bored, frustrated, anxious or subject to chronic stress, it may appear “normal” but not be experiencing a state of well being.

While most zoo industry standards pay only token attention to the psychological needs of animals, these needs are nevertheless an important aspect of zoo animal welfare. In fact, examination of animal behaviour and behavioural responses to stress can be an effective way of determining the appropriateness of various husbandry practices.

In general, animals that are housed in behaviourally impoverished environments show an overall decrease in interaction with their environment. This can be expressed in a variety of ways, such as sitting, lying down or sleeping more; overreaction to novel stimuli; or the development of aberrant behaviours, such as stereotypies (i.e., rocking, pacing, head weaving, tongue playing, etc.).

As the level of stimulation and environmental complexity decreases, most animals display a corresponding decrease in behavioural variability and an increase in behaviours directed at themselves (e.g., hair pulling) or their immediate surroundings (e.g., bar licking). They gradually close themselves off from their environment, rather than interacting with it, in an effort to cope with frustration, boredom and other chronic stressors.

Some animals withdraw to such an extent that they are almost completely unresponsive to outside stimuli – a state often described as “learned helplessness.” Some observers claim learned helplessness is similar to “habituation” but it is different in that it is usually associated with deleterious physiological effects.

Satisfying the behavioural requirements of wildlife in captivity is essential to their welfare, yet it’s an area that has routinely been overlooked or ignored by many zoos. All captive animals must be given some control over their environment and an opportunity to make choices – in short; they must be allowed to make a meaningful contribution to the quality of their own lives.

STEREOTYPIC BEHAVIOUR

Stereotypic behaviour is a term that surfaces frequently when zoo animal welfare is discussed, so it is important to understand what it is. There have been various definitions of stereotypic behaviour, including:

“Repeated, relatively invariant sequence of movements that has no obvious purpose.” (Broom)

“The prolonged, obsessive performance of apparently purposeless activity.” (Webster)

“It is a form of behaviour that occupies the animal for most of its periods of activity without any apparent normal stimulus bringing it into operation.” (Jordan and Ormrod)

The words “ritualized” and “clockwork-like” have been used to describe these behaviours.

The salient points are that the behaviours do not occur in the wild; they are repetitive; and they are apparently functionless. Most stereotypic behaviours occur when animals have failed to cope with or remove themselves from stressful situations.

Stereotyped behaviour should not be confused with displacement behaviour. Displacement behaviour usually occurs when an animal is frustrated in its aims (e.g., to obtain food or to win a confrontation). Displacement behaviour may be unrelated to its original aim (e.g., grooming, scratching or pacing) and its purpose would appear to be an attempt to reduce the feelings of conflict and frustration.

For example, common displacement behaviour in humans occurs when two people have an argument and one of them goes for a walk, washes their car or engages in some other kind of activity to “cool down” or get their mind on something else. The cause of the activity (the displacement behaviour) was the argument but the activity itself may appear to have no relation to it. This same phenomenon occurs in captive wild animals. A chimpanzee frustrated in its attempt to acquire food may thump a stick on the ground or run rapidly around its enclosure to deal with the frustration.

Occasionally, some zoo owners try to characterize stereotypies in their animals as a positive mechanism for coping with stress. They argue that since endorphins are released in animals who are performing stereotypies, the release of these natural opiates makes the animal “happy” in its activity, as though on some kind of “high.” The fact that endorphins are released when the body is under a stressful stimulus such as pain makes this line of thinking highly questionable.

The bottom line is that these behaviours are produced as a result of unsatisfactory environmental conditions and that some degree of mental suffering has occurred along the way and will continue to occur in the future.

ENCLOSURES AND SPACE

Enclosures must be designed with the biological and behavioural needs of the animals they are to contain in mind. Some factors that should be considered in the exhibit design phase include location, size, shape, colour, barrier type, enclosure infrastructure, permanent features (e.g., giant rocks, hillocks, berms, large trees), maintenance, and servicing. Each of these factors should be dictated by the species-specific requirements of the animals being displayed.

All captive animals must be provided with space appropriate to their needs. In determining whether or not a specific amount of space is appropriate, several questions must be asked. First, how much space does the animal actually need to facilitate engagement in natural movement patterns and behaviours? Second, how much space does an animal need to feel secure; so that its fight or flight response isn't triggered or to escape from assault or the threat of assault by cagemates? Third, what are the consequences to the animal of not providing an appropriate amount of space?

Ideally, zoo architects and engineers should consider the most recent ecological and behavioural information from biological field studies and apply that knowledge in the initial design phase. According to Kenneth Polatowski in *Zoo Design, The Reality of Wild Illusions*, “Curators will be able to provide the best care for captive populations of animals when they have the ability to utilize ecological and behavioural data from biological studies and apply the lessons learned there in optimizing the captive environment.” They need to know how much they will be compressing the natural living space of each animal into captive space. Success in satisfying animal needs will only be achieved when their biology and behaviour is understood.

All captive animals must be provided with space appropriate to their needs. In determining whether or not a specific amount of space is appropriate, several questions must be asked. First, how much space does the animal actually need to facilitate engagement in natural movement patterns and behaviours? Second, how much space does an animal need to feel secure, so that its fight or flight response is not triggered? Third, what are the consequences to the animal of not providing enough space?

SUBSTRATES

A critically important facet of appropriate wild animal husbandry is the provision of a suitable substrate. Animals have evolved specific morphological and behavioural traits that allow them to exist comfortably on, or in, particular kinds of substrates. If they are denied the opportunity to engage in ‘normal’ substrate-related activities, they can experience a range of deleterious consequences.

Many enclosures are constructed with concrete and/or ‘gunite’ (a molded concrete-like material) floors (and often walls) that superficially resemble rockwork. Zoos throughout the world make extensive use of these materials, often to the detriment of the animals themselves.

While hard surfaces are desirable from a management standpoint because they are relatively easy to clean and prevent animals from digging out of their enclosures, they are inherently boring and may predispose animals to sores and other problematic physical conditions.

As well, the textures experienced by the animals when moving on these surfaces typically bear little or no resemblance to textures found in nature. They're easy to clean and look somewhat 'real' but they're biologically irrelevant to the animals themselves. The numerous new concrete-based bear exhibits that can be found in an increasing number of zoos are good examples of this.

For the most part, hard substrate enclosures are antithetical to good animal husbandry. They can be uncomfortable and/or physically damaging to the animals; they may increase the thermal load experienced by the animals by radiating heat in hot weather and cooling down rapidly in cold weather; they provide none of the behavioural opportunities that soft substrates do; and they hinder public education by presenting animals in a way that removes them from their natural ecological context.

All enclosures should be equipped with natural 'soft' substrates that provide a range of behavioural opportunities. No animals should be permanently housed on hard surfaces.

ENVIRONMENTAL CONDITIONS

Animal welfare is based, in part, on an animals' ability to successfully adapt to changes in environmental conditions without suffering. Therefore all captive animals should have conditions of temperature, humidity, light and ventilation compatible with their biology and behaviour. For endothermic animal species that regulate their own internal body temperature, the range of environmental conditions they can acclimate to is much broader than ectothermic species, who rely on outside conditions to regulate body temperatures.

Assessment of environmental conditions must be conducted from the animal's perspective. This is particularly important in exhibits housing ectothermic species, where even slight environmental changes can impact on physiological and behavioural functions. For example, low temperatures can slow down or eliminate the process of food digestion in reptiles, so they must be provided with appropriate thermal conditions.

Conditions of high temperature and humidity can be problematic in captivity. Many animals, particularly birds and mammals, have the ability to elevate internal heat production when they get cold, but they have

greater difficulty cooling themselves down when they get excessively hot because they can only reduce heat production to a level compatible with continuation of their basic metabolic processes. This may not be sufficient to deal with conditions of high heat, so captive animals must be given the opportunity to thermoregulate by moving to cooler, shady areas such as forest cover, burrows, rock cavities, pools, etc. They must also be provided with potable water at all times.

PRIVACY

The psychological well-being of zoo animals must take precedence over the desire of visitors to see the animals every time they visit the zoo. Therefore all animals must be provided with the opportunity to remove themselves from the view of visitors, and if required, from their cagemates. Ideally, animals should not have to retreat to off-exhibit areas or interior accommodation to obtain privacy, but instead should be able to do so in the on-display areas.

Exhibiting animals in a way that does not afford them privacy can result in deleterious physiological and behavioural consequences. Animals that are forced to be on display may be subject to chronic stress that can rapidly reach unmanageable levels. This is made even worse when poor exhibit design allows visitors to look down on animals from elevated viewing stations or when visitors are allowed to view animals from all sides, essentially surrounding them.

Lack of privacy is particularly problematic when viewing stations allow visitors to get so close to the animals that their "fight or flight" response (the distance at which an animal would want to flee from or defend itself against a potential threat) is triggered. Violation of the "fight or flight" distance can result in high levels of stress and/or attempts to flee, often resulting in physical injury or, in extreme cases, death.

Privacy from conspecifics can also be an important consideration. Many animal species establish social hierarchies in captivity, where dominant individuals exercise first choice of food, preferred areas for resting, sunning, etc. For this reason, it is important that less dominant animals not only are able to avoid physical contact with dominant conspecifics, but that they are able to remove themselves from visual contact as well.

In existing exhibits, the introduction of earth mounds, large rocks, brush piles, root balls, fences, walls, screening, shelter boxes and other materials may provide animals with appropriate opportunities to obtain privacy.

ENVIRONMENTAL ENRICHMENT

Environmental enrichment is a way of enhancing zoo animal environments and care according to their inhabitant's behavioural biology and natural history. It is a dynamic process in which changes are made that increase the behavioural choices available to animals and that draws out their species-appropriate behaviours.

Environmental enrichment is often touted as the solution to a broad range of behavioural problems in zoo animals and sometimes as an amorphous goal of zoo managers. While it can be a useful strategy for raising the level of welfare in zoo animals, it should not be seen as a panacea. Environmental enrichment is a range of compensatory measures that attempt to deal with deficiencies inherent in animal housing and husbandry systems. It deals more with the symptoms of an existing problem than the root cause of the problem itself.

Satisfying the behavioural requirements of wild animals in captivity is essential to their welfare. Captivity imposes biological and behavioural constraints on animals that they may have no natural way of coping with. Since the nature of their confinement often offers few opportunities for coping, especially when compared to the range of options that would typically be available to them if they were in a wild setting, they must be given as enriched and complex an environment as possible. All captive animals must be given some control over their environment and an opportunity to make choices; in other words, they must be allowed to make a meaningful contribution to the quality of their own lives.

Since the environments that most zoo animals currently experience are not going to change overnight, it is essential that environmental enrichment be viewed as a critical component of daily management that increases animal choice, control and welfare. Under no circumstances, should it be considered as something to get to when time or finances allow.

In addition, it is critical that the process of environmental enrichment be viewed as a dynamic process that requires thought, effort, evaluation and revision. Under no circumstances, should it be considered as something that can be accomplished by occasionally throwing a ball or tire into a cage. The sporadic introduction of novel items into enclosures may encourage brief sessions of activity, but the novelty of those items will quickly fade as familiarity with them grows. Keeping animals occupied and stimulated can, at the best of times, be a challenging prospect.

While environmental enrichment can take many forms, for the purposes of this report, I'll divide it into three basic categories: fixed exhibit features; non-fixed features and novel objects; and olfactory, auditory and food-related enrichment strategies.

Structural enhancement through the provision of appropriate fixed exhibit features, such as a contoured surface topography, giant rocks, mature trees, streams, pools and other items must be carefully considered during the initial exhibit design phase, since the likelihood of those features being changed after construction of the exhibit is minimal. Of course, it goes without saying that the biology and behaviour of the species to be confined must be a major factor in all decisions regarding which fixed features to incorporate into an exhibit.

One often overlooked aspect of enclosure design is the use of vertical space. Incorporating appropriate design features and structures that allow utilization of the vertical dimension will increase opportunities for locomotor activity and exercise, even for animals that are predominantly terrestrial in nature.

There are an almost endless number of non-fixed features and novel objects that can be incorporated into environmental enrichment programs. In fact, this category is restricted only by the imagination of animal caretakers and management teams.

Some examples of non-fixed features and novel objects that can be utilized in enrichment programs are small trees, branches, logs, log piles, small rock piles, brush mounds, root balls, moveable sand/bark/mulch pits, other novel substrates, nesting boxes, pipes, tubes, visual baffles, shade structures, moveable climbing apparatus, platforms, hammocks, bungee cords, rope ladders, hanging rings, scratching posts, pools, streams, sprin-

klers, water jets, rafts, brushes, puzzle feeders, boomer balls, nylabones, traffic cones, wooden rings, cardboard boxes, etc. Most of these are things that animals can use and manipulate.

Many animals can also benefit from auditory and olfactory stimulation. The addition of particular sounds from conspecifics, as well as other species, has been used as an enrichment strategy for several kinds of primates, while the introduction of novel scents has been a successful method of stimulation for several bear species.

Food-related enrichment strategies are a particularly important facet of enrichment programming. For many species, food acquisition activity represents a significant percentage of their daily routine. In fact, the process of acquiring food is extremely important for nearly all animals, with most species having evolved specific morphological and behavioural traits that favour food acquisition over other kinds of activity.

Study of the activity budgets of wild animals provides a basis for comparison with captive animals. Food acquisition activity can comprise 50% or more of a wild animal's daily activity, so it's important that expression of species-typical food-related behaviours in captive animals be encouraged and facilitated by animal caretakers.

SAFETY AND SECURITY

Zoological facilities should always operate in a manner that ensures the safety of animals, staff, visitors and persons living adjacent to zoo property.

All enclosures should be designed with enough space and complexity that animals will not be preoccupied with escape. Contented animals that are able to engage in a range of behaviours are less problematic in this regard.

All barriers (including gates and doors) must be constructed with the physical abilities of the animals in mind. Walls must be high enough that animals cannot jump over them; moats must be wide enough that animals cannot jump across them and fences must be strong enough that animals can't push them over.

Extra attention must be given to gates and doorways. They should fit snugly against fences and walls, leaving no gaps in between and they should not bend or warp

when locked. Doors and gates should always open inwards and sliding barriers should be built so that animals cannot lift them off their hinges or tracks.

Enclosures should ideally be equipped with double door entry systems that allow staff to enter through one door, closing it behind them, before opening the second door into the exhibit. This prevents the inadvertent escape of animals who may 'sneak' past the person entering the exhibit. While this system is advisable for all enclosures, it is absolutely essential for exhibits housing potentially dangerous animals.

As well, all enclosures housing potentially dangerous animals must be equipped with secondary containment areas, where animals can be secured during routine enclosure maintenance, cleaning or for veterinary purposes. This area should be secured by a sliding door that can be safely operated from outside of the exhibit.

All enclosures should be locked, regardless of species. Not only does this prevent animal escapes, particularly with intelligent animals that can learn to open doors and gates, but it may prevent entry into exhibits by trespassers, vandals and thieves.

An essential component of any zoo security strategy is a perimeter fence around the facility. In fact, some zoo associations make perimeter fencing a mandatory requirement for accreditation. Perimeter fencing should ideally be 2 meters in height, topped with barbed wire and the base of the fence should be buried into the ground to a depth of at least 1 meter or affixed to a concrete curb or base. Not only will a perimeter fence discourage escaped animals from leaving the zoo grounds, it will also discourage unwanted entry by human trespassers and feral animals. Large trees that overhang the fence should be trimmed to ensure that they do not fall, thereby creating openings that animals could escape through.

Night lighting should be considered in key areas as an aid to security personnel.

Emergency protocols to deal with animal escape, keeper or visitor injury, natural disasters and other problematic situations must be developed and implemented. Drugs to immobilize potentially dangerous, escaped animals and firearms to prevent loss of life should be on site and in good working order. All staff should be familiar with emergency plans and protocols, which

should, ideally, be laid out in an emergency procedure manual that all staff are required to review.

EDUCATION

While there is little, if any, empirical evidence supporting the claim that the viewing of caged animals is educational, zoos nevertheless claim to be educational institutions. Therefore, if zoos are to fulfill their stated mandate of conveying educational messages about animals and wildlife conservation to the public, their animal exhibits must provide the means to do so. I say this because the majority of zoo visitors (85-90%) do not participate in organized zoo education programs, so the primary vehicle for education of casual visitors in virtually all zoological facilities is still the viewing of caged animals. For this reason, outdated and/or poorly designed exhibits where animals display aberrant behaviours in ugly conditions are educationally counterproductive.

In theory, visitors should leave zoos with a feeling of respect for animals and an awareness of the factors that are causing their destruction in the wild. Since the attention of casual visitors must usually be captured during the first few seconds of viewing an exhibit, it is important that animals be accommodated in a way that satisfies their needs – that allows them to behave in a somewhat natural fashion in surroundings that are similar in form and function to those that their counterparts in the wild experience – thereby increasing the chance that they will appear “normal” and interesting to viewers. Visitor impact is directly linked to the way zoo animals are presented, so exhibit quality must be high.

In addition, if zoos are to be truly educational, they should develop and deliver a range of educational programs for visitors. They include, but are not limited to, interpretive labels and graphics on enclosures; newsletters, guidebooks, brochures and other publications; audio-visual displays; information stations; guided and self-guided tours; meet-the-keeper sessions; lectures and demonstrations.

In many zoos, interpretive graphics are often poorly designed and inaccurate, while others offer vague, completely meaningless whimperings about endangered species. Other types of educational programming are often just as deficient or absent altogether. Unfortunately, many zoos relegate educational program-

ming to the back burner, making it something they get to if time and finances allow, if they get to it at all.

Other zoos make education something separate and distinct from the live animal collection, creating wonderful educational exhibits far removed from the animals themselves. Education should be integrated into every aspect of zoo operations, not kept separate from everything else.

INVESTIGATION NOTES & COMMENTARY

ALLEN FOREST ZOO

Kanpur, Uttar Pradesh—October 21 - 25, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- HIMALAYAN BLACK BEAR:** Oval open air enclosure; major axis 100 ft. Soil substrate. Grass and trees. Water moat surrounding enclosure, 8 ft wide. 8 ft high wall in front of moat. Two attached dens. No food or water observed in enclosure. Three animals observed, including two juveniles. Signboard and barrier present.
- TIGER:** Open air enclosure, 110 ft x 60 ft. Soil substrate. Bushes and trees. 20 ft wall in front of enclosure and 15 ft high fencing at sides. Attached shelter. Dirty green water in pool. Two tigers observed; one normal coloured and one white. Signboard and barrier present.
- SLOTH BEAR:** 75 ft x 45 ft open air enclosure. Soil substrate. Trees. Attached shelter. 7 ft. wide dry moat surrounding enclosure. 10 ft high wall at front of moat. No food or water observed in enclosure. Two animals observed. Signboard and barrier present.
- INDIAN RHINOCEROS:** 120 ft x 65 ft paddock. Soil substrate. Barren enclosure with few trees. Water pool, 20 ft x 10 ft. Attached holding facility. Two animals observed. The director informed there are five animals; three males, one female and one juvenile. Signboard and barrier present.
- ORANGUTAN:** Circular open air enclosure, 60 ft in diameter. Soil substrate. Grass and trees. 12 ft wide surrounding water moat. Front wall of moat approx. 8 ft. high. Attached shelter. Two animals observed; female and male offspring. Signboard and barrier present.
- CHIMPANZEE:** Circular open air enclosure, 50 ft in diameter. Soil substrate. Grass and trees. 12 ft high surrounding wall. One shed inside enclosure. One attached shelter. Two animals observed. Signboard and barrier present.
- HIPPOPOTAMUS:** 60 ft x 40 ft paddock. Soil substrate. Trees. Water pool: 60 ft x 12 ft x 4 ft deep. Food trough. No attached shelter. Two animals observed. Signboard and barrier present.
- ZEBRA:** Triangular open air enclosure with sides measuring approximately 190 ft, 180 ft and 100 ft. Dry soil substrate. No grass but trees present. Attached shelter: 8 ft x 14 ft with cement roof. Water pool. Cement food platform. Four animals observed. The director indicated there are four animals: one male, two females and one juvenile. Animals observed feeding. Signboard and barrier present.
- ASIATIC LION:** Circular open air enclosure approximately 100 ft in diameter. Soil substrate. Grass and trees. 20 ft wide moat surrounding enclosure. Attached den. No water container observed inside enclosure. One lioness observed; appeared ill and kept in the den off-exhibit. Signboard and barrier present.
- SWAMP DEER:** 160 ft x 80 ft enclosure. Soil substrate. Trees. Food trough. Attached shelter. Fourteen animals observed, including four juveniles. Signboard and barrier present.
- CHOWSINGA:** Triangular open air enclosure with sides measuring approximately 190 ft, 100 ft and 100 ft. Soil substrate. Grass and trees. Attached shelter about 18 ft x 18 ft x 12 ft. in size. Two animals observed, including a very young fawn. Signboard and barrier present.
- KINKAJOU:** 10 ft x 4 ft x 8 ft cage. Two attached shelters, with cement substrate and roof, each measuring 2.5 ft x 2.5 ft x 8 ft. One log. One water pot. Light bulb inside enclosure, however interior very dark. One animal observed. Signboard and barrier present.
- LEOPARD CAT:** 10 ft x 4 ft x 8 ft cage. Two attached shelters, with cement substrate and roof, each measuring 2.5 ft x 2.5 ft x 8 ft. One log. One water pot. Light bulb

inside enclosure, however interior quite dark. One animal observed. Signboard and barrier present.

BLACKBUCK: 130 ft x 65 ft paddock. Soil substrate. Trees. Cement shelter approximately 8 ft x 10 ft x 8 ft. in size. Cement food trough. No water observed. Twenty animals observed. Signboard and barrier present.

BARKING DEER: 120 ft x 120 ft open air enclosure. Thick vegetation. Dry moat about 6 ft wide with 5 ft. front wall. No attached shelter. One animal noticed. Signboard and barrier present.

JACKAL: 35 ft x 20 ft open air enclosure with 5 ft high surrounding wall. Soil substrate. Trees and ground vegetation inside. 1 ft x 1.5 ft. water container. Two animals observed. No signboard and barrier.

LEOPARD: 35 ft x 65 ft x 18 ft cage. Soil substrate. Trees. Cement platform inside, approximately 6 ft x 20 ft. Water pool measuring 4 ft x 10 ft. Attached den. Two animals observed. Signboard and barrier present.

RED FOX: 12 ft x 12 ft x 8 ft cage. Cement substrate. Water reservoir, approximately 3 ft x 12 ft. in size. Cement platform, 2.5 ft x 3.5 ft. Attached den, 2 ft x 3.5 ft x 2 ft. One animal observed. No signboard and barrier.

SQUIRREL MONKEY: 10 ft x 8 ft x 8 ft cage. Cement substrate. Roof, partially wired with the rest being cement. 2 ft x 2 ft. cement platform. Water pot. Swing and logs. Attached den. Fruit on the floor of the cage. Three animals observed. Signboard and barrier present.

Birds

LADY AMHERST'S PHEASANT: 10 ft x 12 ft x 8 ft cage. Sand substrate. Cement platform approximately 10 ft x 7 ft. in size. Attached shelter. Vegetation and logs. Water bowl. No food inside. Two birds observed; one male and one female. Signboard and barrier present.

WHITE CRESTED COCKATOO: 16 ft x 12 ft x 8 ft cage. Soil substrate. Vegetation, logs, one metal perch and one wooden box in interior. Four attached shelters. Food and water present. One bird observed. Signboard and barrier present.

EASTERN ROSELLA: 8 ft x 12 ft x 8 ft cage. Soil substrate. Logs. One wooden box. Four attached shelters. Food and water observed. Two birds observed. Signboard and barrier present.

ROSY PELICAN: 30 ft x 40 ft open air enclosure. Soil substrate. Vegetation. Water pool. Birds observed include six Rosy Pelicans and one flamingo. Signboard for Eastern White Pelican and Flamingo. Barrier present.

Reptiles

GHARIAL: Triangular open air enclosure with sides measuring 50 ft, 50 ft and 40 ft. Gravel substrate. Trees. 7 ft x 25 ft. pool. 5 ft spiked wall surrounding enclosure. One Gharial and one Marsh Crocodile observed. Signboard present, but no barrier.

MARSH CROCODILE: 15 ft x 30 ft island. Soil substrate. Trees. 12 ft wide water pool surrounding an island. Running water from tap. Nine animals observed; several appeared to be Spectacled Caimans. No signboard or barrier.

COMMENTARY

The investigators required permission from the zoo director for video filming. Accordingly, a zoo keeper accompanied the investigators. The director, Mrs. Pratibha Singh also requested that the investigators not to film the monkey and pelican enclosures since they had been flooded and were in bad shape. The investigators adhered to her request. Mrs. Pratibha Singh had a detailed discussion on the problems of the zoo with the investigators. She seemed a very knowledgeable and committed individual genuinely concerned for the welfare of the animals. She also accompanied the investigators for part of the visit.

Kanpur Zoo seems very well located in the midst of Allen Forest. There are free living animals like mongooses and many species of butterflies. The zoo seems to be reasonably well maintained.

We were informed that the trees in the zoo were planted by George Bernard Allen in 1913. They include Prosopis and Neem. She said that growth of trees is restricted by the nature of the soil which consists of bihard alkaline ravines. Some enclosures lacked vegetation.

Open air enclosures were relatively spacious, although some of them should be expanded in future. The elephants were chained and required new accommodation. The monkey house was dilapidated and the nocturnal house was in need of significant improvement.

Security seemed quite good with keepers present at various points throughout the zoo. Mrs. Singh was herself on vigil and caught offenders committing nuisance.

Educational efforts are just traditional. The zoo gives the impression that it could be a good nature education centre if it downsized and focused on native species.

Size Of Enclosures: Seem moderately acceptable in most cases, but many grossly undersized enclosures exist. These include enclosures housing Red fox, Indian fox, jackal and monkeys.

Substrate: Soil substrate in open air enclosures. Some cages have soil substrate but many cement and brick substrates were also observed.

Furnishings /Enrichment:Very nominal.

Educational Graphics:Very ordinary.

Safety: Satisfactory.

CONCLUSIONS

Kanpur Zoo, although traditional in its live collection format, appears to of higher quality than most other Indian zoos. The presence of Allen Forest as its location is advantageous.

The zoo director seemed very committed and appeared to be making the best of the restricted funds available for improvement. However, allowing animals to continue to breed is problematic and a drain on resources, so the zoo should stop breeding all large mammals. They should instead focus on fewer species of animals, providing better accommodation and care in the process. Individual animals should be provided with appropriate social environments or transferred to more appropriate accommodation elsewhere. The elephants should not be kept on chains but instead should be given free access to a paddock-type enclosure.

The zoo should focus some attention and resources on rescued animals. If possible, reintroduction efforts should be considered for Swamp Deer.

RECOMMENDATIONS

1. The elephants should be provided with a more expansive, paddock-type enclosure.
2. All small carnivore cages should be expanded.
3. Soft substrates should be added to exhibits with cement floors.
4. All old-style cages should be phased out and replaced.
5. The open air enclosures should be cleaned more often.
6. The nocturnal animal house and the monkey enclosure should be dismantled and replaced with more appropriate accommodation.
7. An institution wide program of environmental enrichment should be developed and implemented for all animals.
8. The chimpanzee and orangutan enclosures need to be substantially enriched with the addition of more trees, logs, swings, ropes and other features and objects.
9. Educational signboards should be improved.
10. A program of audio visual presentations and keeper talks should be developed and delivered. Broader ecosystem issues, and not just facts about animals, should be incorporated into all presentations.
11. The zoo should stop breeding all large animals as most are already common in captivity. Instead, they should focus their efforts on providing sanctuary for abused and rescued wild animals.

ARIGNAR ANNA ZOOLOGICAL PARK

Vandalur, Madra—July 8 – 9, 2002

INTRODUCTION

Arignar Anna Zoological Park is the modernized version of the old Madras Zoo established in 1855. The old zoo was shifted from Madras city to Vandalur Reserve Forest in 1979 by the Tamil Nadu Forest Department. Spreading over an area of 510 hectares of forest, it was inaugurated by the Chief Minister of Tamil Nadu in July 1985. The report is an outline of what was visible during the two days. The zoo has safari parks for carnivores but these could not be visited since they were closed for maintenance during the investigator's visit.

ANIMAL HOUSING & HUSBANDRY

Mammals

NILGIRI LANGUR: Open air enclosure, 120 ft x 75 ft. Trees growing in well vegetated enclosure. Artificial caves inside. Attached den and rock shelter. Enclosure surrounded by 15 ft wide moat. Ten animals observed. Barrier and signboard present.

LION TAILED MACAQUE : Circular open air enclosure, 60 ft in diameter. Surrounded by moat, 20 ft wide. Trees growing inside enclosure. Artificial caves in enclosure and attached den. One animal seen. Signboard and barrier present.

CHIMPANZEE: Circular open air enclosure, 60 ft in diameter. Surrounded by moat, 12 ft wide. Trees growing inside. Hut shelter and feeding platform beneath. Logs present. Artificial cave attached. Two animals observed. Signboard and barrier present.

SAVANNAH BABOON: Open air enclosure, 120 ft x 75 ft. Surrounded by moat, 15 ft wide. Trees growing inside. Artificial cave inside enclosure. One animal observed inside cave. Signboard and barrier present.

GREY CHEEKED MANGABEY: 20 ft x 20 ft x 9 ft cage. Sand substrate. Dry branches inside. Roof of cage partially covered with thatch. Attached den. No food or water seen. Two animals observed. Signboard and barrier present.

RHESUS MACAQUE: 20 ft x 20 ft x 9 ft cage. Sand substrate and dead logs. Roof of cage partially covered with thatch. No food or water observed. Attached den. Six specimens observed. Signboard and barrier present.

SAVANNAH BABOON: 20 ft x 20 ft x 9 ft cage. Sand substrate and dead logs. Roof of cage partially covered with thatch. No food or water observed. Attached den. Two specimens observed. Signboard and barrier present.

BROWN CAPUCHIN: 20 ft x 20 ft x 9 ft cage. Sand substrate and dead logs. Roof of cage partially covered with thatch. No food or water observed. Attached den. Two specimens observed. One animal exhibiting severe stereotypic behaviour in the form of neck twisting. Signboard and barrier present.

SAVANNAH BABOON: 20 ft x 20 ft x 9 ft cage. Sand substrate and dead logs. Roof of cage partially covered with thatch. No food or water observed. Attached den. One specimen observed. Signboard and barrier present.

LION TAILED MACAQUE: Circular open air enclosure, 60 ft in diameter. Surrounded by water filled moat, 20 ft wide. Two iron cages inside enclosure. Rock cave inside. Trees growing inside. Two animals observed. No signboard.

COMMON LANGUR: Circular open air enclosure, 75 ft in diameter. Dry water moat, 12 ft wide. Attached den. Trees growing inside enclosure. No animals seen. Signboard present.

BARKING DEER: Open air enclosure, 200 ft x 200 ft. Well vegetated with plenty of trees. Moat present. Two animals seen. Signboard and barrier present.

BLACKBUCK: Open air enclosure, 200 ft x 200 ft. Trees inside. Dry moat in front. Fifteen animals seen. Signboard and barrier present.

AXIS DEER: Open air enclosure, 150 ft x 150 ft. Trees and water pool inside. Twenty animals observed. Signboard present.

GAUR: Open air enclosure, heavily vegetated, 200 ft x 100 ft. No animal seen. Signboard present.

HOG DEER: Open air enclosure, 150 ft x 150 ft. Trees growing inside. Twenty animals observed. Signboard present.

COMMON OTTER: Glass fronted sloping open air enclosure. 30 ft x 30 ft. Brick walls forming perimeter. Terraced soil substrate. Rocks and water pool present inside enclosure. Two animals observed. Signboard and barrier present. Animals observed eating fish in water.

SAMBAR: Open air grassy enclosure, 300 ft x 300 ft. Trees inside. Twenty animals seen. Signboard and barrier present.

NILGAI: Open air grassy enclosure with trees, 200 ft x 200 ft. Five animals seen. Signboard and barrier in front of cage.

LION (HYBRID?): Open air enclosure with trees and grass, 200 ft x 100 ft. 20 ft wide dry moat in front of enclosure. One animal seen sleeping. Signboard and barrier present.

BROW ANTLERED DEER(SANGAI): Open air enclosure with trees, 200 ft x 200 ft. Water moat in front of enclosure. No animal observed.

SAMBAR: Open air enclosure, 200 ft x 200 ft. Thatch shelter. Dry moat in front of enclosure. Fifty animals seen. Signboard and barrier missing.

GRIZZLED GIANT SQUIRREL: Glass fronted enclosure with brick walls and netting on one side, 20 ft x 15 ft x 20 ft. Soil substrate. Rock shelter, branches and grasses inside. Nesting box and den inside. Food and water seen. Signboard present. One animal present.

INDIAN GIANT SQUIRREL: Glass fronted enclosure with brick walls and netting on one side, 20 ft x 15 ft x 20 ft. Soil substrate. Rock shelter, branches and grasses inside. Nesting box and den inside. Food and water seen. Signboard present. One animal seen.

INDIAN WILD ASS: Open air grassy enclosure with trees, 200 ft x 100 ft. Dry moat in front of enclosure. Attached shelter. Food trough seen. One specimen seen. No signboard and barrier.

WOLF: Circular open air enclosure, 300 ft in circumference. Grass and trees inside. No animal seen. Signboard and barrier present.

STRIPED HYENA: Open air enclosure, 200 ft x 150 ft. Grasses and trees inside. Earthen mounds and water pool observed. Attached den. Two animals seen, both exhibiting stereotypic behaviour (pacing). Signboard and barrier present.

DHOLE: 20 ft x 10 ft x 8 ft cage. Sand substrate and thatched roof. Two animals seen. Attached shelter and dirty water pool. Barrier present.

SLOTH BEAR: Open air enclosure, 200 ft x 100 ft. Grassy enclosure with trees inside. Attached rock cave as shelter. Dry moat in front of enclosure. Three animals seen. Signboard and barrier in front of cage.

HIMALAYAN BLACK BEAR: Open air enclosure, 250 ft x 150 ft. Grassy enclosure with trees inside. Thatched shelter and attached rock cave. Dry moat in front of enclosure. Two animals seen. Signboard and barrier in front of cage.

HIMALAYAN BLACK BEAR: Open air enclosure, 200 ft x 100 ft. Grassy enclosure with trees inside. Thatched shelter and attached rock cave. Dry moat in front of enclosure. One animal seen. Signboard and barrier in front of cage.

JACKAL: Open air enclosure, 200 ft x 100 ft. Grasses and trees inside. Dry moat in front of enclosure. Rock shelter and attached den. Signboard present.

DHOLE: Open air enclosure, 200 ft x 100 ft. Grasses and trees inside. Dry moat in front of enclosure. Artificial cave seen. One animal seen.

TIGER: Open air enclosure, 150 ft x 100 ft. Dry moat, 25 ft wide and 20 ft high. Attached cave and pool inside. One animal observed. Signboard and barrier present.

JAGUAR: 40 ft x 40 ft x 15 ft cage. Grasses and trees inside. Water pool. Attached den. One animal seen. Signboard and barrier present.

LEOPARD: 12 ft x 12 ft x 12 ft cage. Thatched roof. Wooden log inside. Sand substrate. One animal seen. Barrier and signboard present.

LEOPARD: 40 ft x 100 ft x 25 ft cage. Grass and shrubs inside. Trees and bamboo clumps observed inside cage. Artificial caves inside cage. One animal seen. Signboard and barrier present.

LION TAILED MACAQUE: 35 ft x 25 ft x 12 ft cage. Plants growing on roof. Cement floor. Gymnasium like bars in cage. Creepers inside. 12 ft x 12 ft x 8 ft shelter. Logs inside. Five animals seen, including one baby. Signboard and barrier present.

GRANT'S ZEBRA: Open air enclosure, 200 ft x 200 ft. 10 ft high walls. Dry moat in front of enclosure. Trees, shrubs, logs and rocks inside enclosure. Thatched shelter inside enclosure. Termite mounds observed in enclosure. Four animals seen. Signboard and barrier in front of cage. Animals observed drinking from water pipe.

GIRAFFE: Open air enclosure, 150 ft x 200 ft. Enclosure has netting in some places within. Food bowls attached to trees. Shelter and water pools. Eucalyptus and neem trees inside enclosure. Two animals seen. Signboard present. 3 ft high fencing in front of enclosure.

Birds

INDIAN PEAFOWL: Circular cage, 150 ft in circumference and 20 ft high. Sand substrate and trees inside cage. Five birds seen, one female and four males. Signboard present but no barrier. Food and water inside.

ALBINO PEAFOWL: Circular cage, 200 ft in circumference and 12 ft high. Sand substrate. Dry branches and rock shelter. Nine birds seen. Signboard present but no barrier.

SULPHUR CRESTED COCKATOO: 15 ft x 15 ft x 12 ft cage. Sand substrate and dead branches. Log shelter and artificial hood. One bird seen. Food and water not observed. Signboard and barrier present.

GREAT SULPHUR CRESTED COCKATOO: 15 ft x 15 ft x 12 ft cage. Sand substrate and dead branches. Log shelter and artificial hood. Two birds seen. Food and water not observed. Signboard and barrier present.

SULPHUR CRESTED COCKATOO: Hexagonal cage, each side 8 ft in length. 15 ft high. Two wooden shelters. Branches inside cage. Two birds seen. Signboard and barrier present.

CASSOWARY: Open air enclosure, 60 ft x 50 ft. Trees and water pool inside. Thatched shelter. Signboard and barrier absent.

RED BILLED BLUE MAGPIE: Hexagonal cage, each side 8 ft in length. One side cemented. 15 ft high. One bird seen. No signboard and barrier. No food or water observed.

GREY JUNGLE FOWL: 8 ft x 15 ft x 8 ft cage. Sand substrate. Plants inside. One bird observed. Signboard present.

GUINEA FOWL: 8 ft x 15 ft x 8 ft cage. Sand substrate. Plants inside. One bird observed. Signboard present.

GREY COCKATIEL: Circular cage, 85 ft in circumference. 12 ft high. Dry branches and nesting boxes. Fifteen birds observed. Food and water present.

SILVER PHEASANT: 8 ft x 8 ft x 6 ft cage. Sand substrate. Brick shelter. Food and water present. Two plants inside. Two birds observed, one male and one female.

GREY HORNBILL: 15 ft x 15 ft x 12 ft cage. Sand floor and thatched roof. Wooden nesting box and artificial cave observed. Plants and bamboo clumps inside. One bird seen. Signboard and barrier present.

WHITE PEAFOWL: 15 ft x 15 ft x 12 ft cage. Backside of the cage built of rock. No nesting box. Plants and bamboo clumps inside. Artificial cave. Cage has thatched roof. One bird observed.

ORIENTAL TURTLE DOVE: 15 ft x 15 ft x 12 ft cage. Backside of the cage built of rock. Sand substrate and small waterfall at the back of cage. No nesting box. Plants and bamboo clumps inside. Artificial cave. Cage has thatched roof. Two birds observed.

LARGE INDIAN & ROSE RINGED PARAKEETS: 15 ft x 20 ft x 12 ft cage. Thatched roof. Sand substrate and

branches inside. Nesting boxes. Food and water observed. Ten birds observed, seven Large Indian Parakeets and three Rose Ringed Parakeets. Signboard and barrier present.

ROSE RINGED PARAKEET: 15 ft x 20 ft x 12 ft cage. Thatched roof. Sand substrate and branches inside. Nesting boxes. Food and water observed. Seventeen birds seen. Signboard and barrier present.

ROSY PELICAN: 80 ft x 25 ft x 20 ft cage. Cement substrate and water pool. Ten birds observed. Signboard and barrier absent.

SCARLET MACAW: 15 ft x 20 ft x 12 ft cage. Thatched roof. Sand substrate and branches inside. Nesting boxes. Plants inside. Food and water observed. One bird observed. Signboard and barrier present.

PEACH FACED LOVEBIRD: 10 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Wooden platform and cement shelter. Branches inside. Food and water observed. Two birds seen, one Peach Faced Lovebird and one Masked Lovebird. Signboard present, but does not mention Masked Lovebird species. Barrier present.

WHITE BROWED BULBUL: 10 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Wooden platform and cement shelter. Branches inside. Food and water observed. One bird seen. Signboard and barrier in front of cage.

WHITE COCKATIEL: 10 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Wooden platform and cement shelter. Branches inside. Food and water observed. Five birds seen. Signboard and barrier in front of cage.

PEARL COCKATIEL: 10 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Wooden platform and cement shelter. Branches inside. Food and water observed. One bird seen. Signboard and barrier in front of cage.

BLOSSOM HEADED PARAKEET: 10 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Wooden platform and cement shelter. Branches inside. Food and water observed. Four birds seen. Signboard and barrier in front of cage.

RED BREASTED PARAKEET: 10 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Wooden platform and cement shelter. Branches inside. Food and water observed. Three birds seen. Signboard and barrier in front of cage.

GREY PARTRIDGE: 12 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Branches and wooden platform. Food and water observed. No nesting box. Six birds seen. Signboard and barrier present.

INDIAN KOEL: 10 ft x 15 ft x 15 ft cage. Two birds (one male and one female), male seems ill with ruffled and dry feathers lacking the lustre seen in healthy birds. No signboard. Food and water not observed.

WHITE DOMESTIC CHICKEN: 10 ft x 15 ft x 15 ft cage. Sand substrate and thatched roof. No branches. Two birds seen.

SHIKRAS: 20 ft x 15 ft x 15 ft cage. Cement substrate. Two birds. Food and water not observed. Branches. Cage signboard says Binturong. Barrier present.

AVIARY: 150 ft x 50 ft cage. Trees inside. Water pool and small meadow. Species of birds seen include White Stork, Demoiselle Crane, Painted Stork, Goose and multiple duck species.

SARUS CRANE: Open air enclosure, 100 ft x 50 ft. Trees inside. Water pool. One bird seen. Barrier present.

WHITE NECKED STORK & ADJUTANT STORK: Open air enclosure, 100 ft x 50 ft. Trees growing inside enclosure. Dry moat in front of enclosure. One White Necked Stork and one Adjutant Stork observed. Signboard and barrier absent.

EMU: Open air enclosure, 100 ft x 50 ft. Trees growing inside. Dry moat in front of enclosure.

AVIARY: 200 ft x 100 ft x 15 ft cage. Species observed are Lesser Flamingo, Painted Stork, Pond Heron, Rosy Pelican, Grey Pelican, Night Heron and Ruddy Shelduck. Water pool inside. Signboard present but no barrier.

WHITE BACKED VULTURE: 50 ft x 25 ft x 25 ft cage. One bird seen. Signboard present.

BLACK KITE: 50 ft x 25 ft x 25 ft cage. Three birds seen. Signboard present.

AVIARY: 150 ft x 200 ft x 15 ft cage. Species seen include Painted Stork, Grey Pelican, Little Egret and Cattle Egret. Water pool inside. Signboard present in front of cage.

Reptiles

SOUTHERN HILL MYNAH: 10 ft x 10 ft x 12 ft cage. Thatched roof and sand substrate. Wooden platform and cement shelter. Branches inside. Food and water observed. One bird seen. Signboard and barrier present.

STARRED TORTOISE: Pit, 20 ft x 20 ft. Sand substrate. Thirty animals seen.

MADRAS POND TURTLE: Pit, 20 ft x 20 ft. Sand substrate. No animals seen.

WATER MONITOR: Pit, 20 ft x 10 ft. Sand substrate, trees and grasses. Water pool. Three animals observed. Signboard present. No food seen in the form of dead or live rats or meat.

GREEN IGUANA: Pit, 20 ft x 10 ft. Sand substrate, trees inside. One animal seen. Signboard present but no barrier.

SPECTACLED CAIMAN: Pit, 15 ft x 10 ft. Sand substrate and cement water pool. Three animals seen. Signboard and barrier absent.

BANDED KRAIT: Glass fronted cage, 8 ft x 6 ft x 8 ft. Sand substrate. Dry logs and potted plants. One snake seen. Signboard and barrier present.

CHAMELEON: Glass fronted cage, 8 ft x 6 ft x 8 ft. Sand substrate. Dry logs and potted plants. No animal seen. Signboard and barrier present.

COMMON SAND BOA: Glass fronted cage, 8 ft x 6 ft x 8 ft. Sand substrate. Dry logs and potted plants. One snake seen. Signboard and barrier present.

ROCK PYTHON: Glass fronted cage, 8 ft x 6 ft x 8 ft. Sand substrate. Dry logs and potted plants. Two snakes seen. Signboard and barrier present.

RAT SNAKE: Glass fronted cage, 8 ft x 6 ft x 8 ft. Sand substrate. Dry logs and potted plants. Two snakes seen. Signboard and barrier present.

BINOCELLATE COBRA: Glass fronted cage, 8 ft x 6 ft x 8 ft. Sand substrate. Dry logs and potted plants. Three snakes seen. Signboard and barrier present.

ROCK PYTHON: Glass fronted cage, 12 ft x 12 ft x 8 ft. Sand substrate. Dry logs and potted plants. Two snakes seen. Signboard and barrier present.

RUSSELL'S VIPER: Glass fronted cage, 6 ft x 8 ft x 8 ft. Sand substrate and potted plants. No snake seen. Signboard in front of cage.

ROCK PYTHON: Glass fronted cage, 6 ft x 8 ft x 8 ft. Sand substrate and water pool. One snake seen. Signboard and barrier in front of cage.

CHECKERED KEELBACK WATER SNAKE: Glass fronted cage, 6 ft x 8 ft x 8 ft. Sand substrate and water pool. Potted plants. No snake seen. Signboard and barrier in front of cage.

GREEN WHIP SNAKE: Glass fronted cage, 6 ft x 8 ft x 8 ft. Sand substrate and water pool. Potted plants. No snake seen. Signboard and barrier in front of cage.

ROCK PYTHON: Glass fronted cage, 6 ft x 8 ft x 8 ft. Sand substrate and water pool. Potted plants. Two Rock Pythons seen. Signboard says Saw Scaled Viper. Barrier in front of cage.

ROCK PYTHON: Glass fronted cage, 6 ft x 8 ft x 8 ft. Sand substrate. Potted plants. Two juvenile Rock Pythons seen. Barrier in front of cage.

KING COBRA: Glass fronted cage, 8 ft x 8 ft x 8 ft. Sand substrate and water pool. Dry branches. One snake seen. Signboard and barrier in front of cage.

KING COBRA: Glass fronted cage, 8 ft x 8 ft x 8 ft. Sand substrate and water pool. Dry branches. One snake seen. Signboard and barrier in front of cage.

ESTUARINE CROCODILE: Pit, 25 ft x 20 ft x 3 ft. Sand substrate and trees inside. Water pool. One animal seen. Signboard present.

AMERICAN ALLIGATOR: Pit, 25 ft x 15 ft x 3 ft. Sand substrate and trees inside. Water pool. One animal seen. Signboard present.

NILE CROCODILE : Pit, 30 ft x 12 ft x 3 ft. Sand substrate and trees inside. Water pool. One animal seen. Signboard present.

MARSH CROCODILE: Pit, 100 ft x 50 ft x 3 ft. Sand substrate and trees inside. Two water pools. Sixty animals and evident overcrowding with animals jostling around for entering water pools. Signboard present.

MORELET'S CROCODILE: Pit, 20 ft x 15 ft x 3 ft. Sand substrate and trees inside. Water pool. Four animals seen. Signboard present.

GHARIAL: Circular pit, 50 ft in diameter. Sand substrate. Water pool. Four animals. Signboard present.

Nocturnal House

COMMON PALM CIVET & JUNGLE CAT: Glass fronted cage with 2.5 ft high wire on top of glass front. Cement floor. Branches inside. Cage divided into two parts. No animal seen. Signboards present.

SMALL INDIAN CIVET: Glass fronted cage with 1.5 high wire on top of glass front. Cage dimension, 10 ft x 8 ft x 8 ft. Cement substrate. Dry branches and food bowl. Two animals seen. Wooden platform and loft. One blue tube as lighting. Signboard present.

BINTURONG: Glass fronted cage, 10 ft x 8 ft x 8 ft with 1.5 ft high wire netting on top of glass. Cement substrate. Dry branches. Wooden platform. Food bowl. One animal seen. Blue tube as light source. Two small cages attached to this cage. Signboard present.

BINTURONG: Glass fronted cage, 10 ft x 8 ft x 8 ft. Cement substrate. Dry branches. Water pot and wooden platform. Food not seen inside cage. Blue tube as light source inside cage. One animal seen. Signboard absent.

HORNED EAGLE OWL & BARN OWL: Open enclosure, 20 ft x 8 ft x 15 ft, with no barriers preventing flight, inside Nocturnal House. Cement floor with sand. Water pool. Two wooden nesting boxes. Artificial rock construction within enclosure limits. Concrete and cement branches inside enclosure. Three birds, two

Barn Owls and one Horned Eagle Owl. Birds observed flying freely. Signboard and barrier absent.

INDIAN PORCUPINE: Pit, 20 ft x 8 ft x 5 ft. Cement floor covered with sand. Water pot. Concrete and cement branches inside enclosure. Three animals seen. Signboard present but no barrier.

COMMON PALM CIVET: 7 ft x 10 ft x 8 ft cage with cement wall at the back. Cement floor. Branches and water bowl seen. Wire netting roof. Blue tube as light source inside cage. Two animals seen, a fight occurred between the two and was recorded on video.

GREY KANGAROO: Open air enclosure, 60 ft x 100 ft. Dry moat in front of enclosure. Attached shelter. Enclosure area sandy with trees and shrubs inside. One animal seen. Signboard and barrier present.

PYGMY HIPPO: Open air enclosure, 150 ft x 200 ft with 5 ft high wall as perimeter. Sandy land area. 20 foot by 10 foot water pool. Dry moat surrounding enclosure. Termite mounds and trees observed inside enclosure. No animal seen. Signboard and barrier present.

PYGMY HIPPO: Open air enclosure, 200 ft x 150 ft with 5 ft high wall as perimeter. Sandy land area. 20 ft x 10 ft water pool. Termite mounds and trees observed inside enclosure. Rocks and logs. Holding facility attached. One animal seen. Signboard and barrier present.

HIPPOTAMUS: Open air enclosure, 200 ft x 150 ft with 5 ft high wall as perimeter. Sandy land area. 70 ft x 20 ft water pool, divided in two sections. Termite mounds and trees observed inside enclosure. Rocks and logs. Holding facility attached. One animal seen. Signboard and barrier present.

ASIAN ELEPHANT: 1000 ft x 1000 ft open air enclosure. Forested enclosure. Dry moat in front of enclosure. Termite mounds and logs inside enclosure. Plants growing profusely inside enclosure. Thatched shelter attached. Three animals seen, two adults in enclosure and one juvenile beneath thatched shed. Signboard and barrier present.

WILD BOAR: Open air enclosure, 100 ft x 70 ft. Attached shelter. Trees and plants inside. Grasses growing in profusion within enclosure area. No animal seen. Signboard and barrier present.

COMMENTARY

Arignar Anna Zoo is a well planned, clean, tidy zoo. Large open air enclosures seem to be the norm, providing adequate space to the animals. Most animals seem to be in good health. A few were observed engaged in stereotypic behaviours. Overall, the zoo appeared overcrowded.

Direction boards are lacking in many places. The zoo being large provides for an enjoyable visit but visitors are very often perplexed as to what they want to see and where. There is a marked lack of public facilities including toilets and food outlets. Signboards are legible but provide only very basic information about the animals.

This zoo seems to have bred a number of species including Nilgiri langurs, Lion-tailed macaques and Asiatic Lions. But they do not appear to be involved in any reintroduction efforts.

There is room for improvement at Arignar Anna Zoological Park but the zoo deserves credit for what it has accomplished so far. It shows a remarkable concern for the welfare of captive animals.

RECOMMENDATIONS

1. The zoo should downsize its live animal collection.
2. The nocturnal animal house should be dismantled and the animals moved into better exhibits elsewhere.
3. A program of environmental enrichment should be developed and implemented for all animals.
4. This zoo should initiate an active program supporting of legitimate in-situ and ex-situ conservation initiatives.
5. Educational programming throughout the zoo should be improved.

AURANGABAD ZOO

Aurangabad, Maharashtra—November 10, 2002

INTRODUCTION

Aurangabad Zoo is a government operated facility that was established in 1984. It is situated in the middle of the city next to the main bus stand. The zoo is part of a park with flower displays, gardens and children's play facilities, such as swings.

ANIMAL HOUSING & HUSBANDRY

Mammals

- BLACKBUCK:** 110 ft x 90 ft open air paddock. Soil substrate but no grass. Several trees. No food trough noticed. Metal bucket holding water. Enclosure surrounded by fencing 8 ft high. Attached shelter. Approximately 50 individuals observed. Signboard present, but no barrier.
- WOLF:** 10 ft x 12 ft x 10 ft cage. Cement substrate. Cement platform at the back of the cage. Circular metal pot holding water, 1 ft in diameter. Tin covering on roof of cage. Attached den. No animal observed. Signboard having information in both Hindi and English. Barrier present.
- WOLF:** 10 ft x 12 ft x 10 ft cage. Cement substrate. Cement platform at the back of the cage. Circular metal pot holding water, 1 ft in diameter. Tin covering on roof of cage. One animal observed, pacing continuously. The cage had just been cleaned and the floor of the cage was slippery and the animal was observed tripping on more than one occasion. Attached den. Signboard having information in both Hindi and English. Barrier present.
- COMMON PALM CIVET:** 10 ft x 12 ft x 10 ft cage. Cement substrate. Cement platform at the back of the cage. Circular metal pot holding water, 1 ft in diameter. Tin covering on roof of cage. Attached den. No animal observed. Signboard having information in both Hindi and English. Barrier present.
- COMMON LANGUR:** 10 ft x 12 ft x 10 ft cage. Cement substrate. Cement platform at the back of the cage. Circular metal pot holding water, 1 ft in diameter. Tin covering on roof of cage. Attached den. A single animal observed. Barrier present.
- JACKAL:** 10 ft x 12 ft x 10 ft cage. Cement substrate. Cement platform at the back of the cage. Circular metal pot holding water, 1 ft in diameter. Tin covering on roof of cage. Attached den. Six animals observed, all of them pacing. Signboard in Hindi and English. Barrier present.
- STRIPED HYENA:** 10 ft x 12 ft x 10 ft cage. Cement substrate. Cement platform at the back of the cage. Circular metal pot holding water, 1 ft in diameter. Tin covering on roof of cage. Attached den. Two animals observed, one stereotypically pacing. Signboard having information in both Hindi and English. Barrier present.
- INDIAN PORCUPINE:** 10 ft x 12 ft x 10 ft cage. Cement substrate. Tin covering on roof. Cement platform at the back of cage. Four cement mounds as shelter. Vegetables strewn on the ground. Water in circular metal pot, 1 ft in diameter. Two logs. Seven animals observed. Signboard conveying information in both Hindi and English. Barrier present.
- SAMBAR:** 100 ft x 105 ft paddock. Soil substrate but no grass. Several trees. Cement water reservoir, 1.5 ft x 10 ft. Two attached sheds. Browse on the floor of the sheds. Eighteen animals observed. Signboard present but no barrier.
- CHINKARA OR INDIAN GAZELLE:** 20 ft x 110 ft paddock. Soil substrate and grass growing inside paddock. Four large trees inside enclosure. No water bowl

observed. No food trough observed either. No shelter. Three animals observed. Signboard present but no barrier.

AXIS DEER: 65 ft x 110 ft paddock. Soil substrate and grasses. Many trees inside enclosure. Metal water pot inside. No food trough observed. One shelter. Five animals observed. Signboard and barrier present.

NILGAI: 55 ft x 105 ft paddock. Soil substrate but no grass. Several trees. Cement water reservoir, 1.5 ft x 10 ft. Two attached sheds. Browse on the floor of the sheds. Four animals observed. Signboard present but no barrier.

WHITE TIGER: 75 ft x 55 ft open air enclosure. Soil substrate and grasses growing inside. Water pool, 5 ft x 6 ft. 18 ft high fencing. 15 ft wide moat in front of land area. Front wall of moat approximately 15 ft high. One attached den. One animal observed sleeping. Animal procured from Nandankanan Zoo in Orissa. Signboard and barrier present.

WHITE TIGER: 75 ft x 55 ft open air enclosure. Soil substrate with trees, gr. Circular water pool, 7 ft in diameter. Eighteen ft high fencing. 15 ft wide dry moat in front of enclosure. 15 ft high wall front wall of moat. One attached den. One animal observed pacing. Animal procured from Nandankanan Zoo in Orissa. Signboard and barrier present.

AFRICAN LION: 120 ft x 75 ft open air enclosure. . Soil substrate and grasses growing inside. 18 ft high fencing. 15 ft wide moat in front of land area. 15 ft high front wall of moat. One attached den. Two males observed. Animals procured from Sanjay Gandhi Safari Park in Bombay. Signboard and barrier present.

LEOPARD: 75 ft x 25 ft x 20 ft cage. Soil substrate. Water pool, 5 ft x 8 ft. Tap inside. Iron framework on the roof of cage. Four attached shelters. Three animals observed; two in the cage and one in a den. The two animals in the cage were observed in sexual activity. Signboard and barrier present.

ASSAMESE MACAQUE: 15 ft x 15 ft x 10 ft cage. Cement substrate. Few logs. Cement water reservoir, 1.5 ft x 1.5 ft. Two attached dens. One animal observed pacing and bar biting. Visitors teasing the animal by throwing dust and spitting. No signboard, but barrier present.

BONNET MACAQUE: 40 ft x 15 ft x 10 ft cage. Soil substrate, one log inside. One swing. Cement water pool, 1 ft x 2 ft, having extremely filthy water. Two attached shelters. Two animals observed. Signboard and barrier present.

BONNET MACAQUE: 15 ft x 12 ft x 10 ft cage. Soil substrate, One log inside. One tire hanging from roof. Cement water pool, 1 ft x 2 ft, having extremely filthy water. Two attached shelters observed, one in cage and one inside den. One animal having a large bare patch of skin. Signboard and barrier present.

ASIAN ELEPHANT: 80 ft x 30 ft yard, dry and barren with almost no vegetation. 25 ft x 40 ft cement paddock attached to yard with two sheds, each 15 ft x 20 ft x 30 ft. Cement food trough. Two animals observed chained inside a shed. Signboard and barrier present. Cement paddock having wire front making very difficult to see the animals or photograph them. Signboard and barrier present. Animals obtained from the wild from Mysore.

Birds

AVIARY: 50 ft x 50 ft x 20 ft cage. Dirty water pool. Birds observed include 1 painted stork, 1 ruddy shelduck, 3 cattle egrets, 1 heron (unidentified). No signboard or barrier.

Reptiles

MARSH CROCODILE: Trapezium-shaped pit having sides 30 ft, 20 ft, 10 ft and 20 ft. Soil substrate and trees inside. 8 ft high wall on three sides. Wire fencing (damaged in places with jagged wire sticking out) in front. Trapezium-shaped water pool having sides 8 ft, 15 ft, 15 ft and 10 ft. Water depth 6 inches. Two animals observed. Signboard and barrier present.

RUSSELL'S VIPER: Glass fronted cage, trapezium shaped with sides 12 ft, 8 ft, 7 ft and 5 ft. . 7 ft high walls on three sides. Wire fencing on top. Soil substrate. Plants. Water pool inside, 1 ft x 1 ft. Electric plug inside cage. Seven snakes observed. Signboard and barrier present.

COMMON EARTH SNAKE: 8 ft x 5 ft x 7 ft glass fronted cage. Soil substrate. Plants. Live frogs observed in cage. Signboard and barrier present.

RED SAND BOA: 7 ft x 6 ft x 7 ft glass fronted cage. Soil substrate and few plants inside. One snake observed. No signboard but barrier present.

INDIAN COBRA: 12 ft x 6 ft x 7 ft glass fronted cage. Soil substrate and some plants. Two snakes observed. Signboard and barrier present.

ROCK PYTHON: 10 ft x 6 ft x 7 ft glass fronted cage. Soil substrate and scanty vegetation. One snake observed. No water facility. No signboard but barrier present.

ROCK PYTHON: Trapezium-shaped glass fronted cage with sides 12 ft, 14 ft, 14 ft and 25 ft and 7 ft high. Very little vegetation. No animals observed. Signboard and barrier present.

COMMON KRAIT: 10 ft x 6 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. One wooden shelter, 1 ft x 2 ft x 1 ft. One plastic water bowl inside shelter. One snake observed in shelter. Signboard and barrier present.

GREEN SNAKE: 10 ft x 6 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. One log. Three snakes observed. Signboard and barrier.

TRINKET SNAKE: 10 ft x 6 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. Nine snakes observed. Signboard and barrier.

ROCK PYTHON: 10 ft x 6 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. No snake observed. Signboard and barrier.

RAT SNAKE: 6 ft x 6 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. Three snakes observed. Signboard and barrier.

RAT SNAKE : 12 ft x 6 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. One wooden box inside. Water bowl inside box. Six snakes observed. Live frogs inside. Signboard and barrier.

INDIAN RACER SNAKE: 12 ft x 6 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. One wooden box inside. Water bowl inside box. One log. Five snakes observed. Live frogs inside. Signboard and barrier.

COMMON MONITOR LIZARD: 8 ft x 7 ft x 7 ft cage. Barren cage with no vegetation. Cement substrate. Dry pool, 1 ft x 1 ft. Two animals observed. Animals looked listless, emaciated (spine and ribs protruding) and unhealthy. Signboard and barrier observed.

STARRED TORTOISE: 8 ft x 6 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. One wooden box inside. Two tortoises observed. Signboard and barrier.

INDIAN COBRA: 10 ft x 5 ft x 7 ft glass fronted cage. Wire fencing on top. Soil substrate and plants. Water pool, 1 ft x 1 ft. One wooden box inside. Five snakes observed. Signboard and barrier.

COMMENTARY

It is a big surprise to find a zoo in the first place in a place like Aurangabad. The investigators are reminded of Gerald Durrell's comments in his book, *The Stationary Ark*: "If your city does not have a zoo, you are not keeping up with the city next door." This zoo is a potent example of a zoo started merely as a status symbol and not for any worthwhile conservation purpose. Every hamlet in India does not need a zoo and Aurangabad Zoo is a zoo which serves no useful function.

Aurangabad is rundown and dilapidated. Most cages were rusting with damaged, jagged and torn pieces of fencing. The wolf and Striped hyena cages seemed particularly inadequate. The jackals and porcupines were housed in barren cement cages with no environmental enrichment. The primate cages and elephant yard were also not properly outfitted or enriched. Lack of privacy areas was common to all enclosures. The natural 'fight or flight' response of many animals would be violated in current conditions. The reptile house seemed in various stages of decay. None of the cages offered any privacy for the animals and people were observed disturbing the animals at will.

An aquarium display with several tanks displaying a variety of fish species all had murky water making it difficult to see the fish. There was a separate charge for admission to the aquarium. Overall, it was antiquated in design and depressing.

Abnormal behaviours, including stereotypies, were observed in the lions and tigers. The behaviour of the lions seemed distinctly abnormal with one male trying to mount the other male. The elephants were chained, an inappropriate method of restraining these animals for extended periods, that can lead to boredom, frustration and the development of abnormal behaviours.

Educational material was lacking or absent altogether. Where it did exist, it was poorly presented and unattractive (i.e., signboards). There is no conservation messaging in this zoo.

The zoo gives the impression of having been constructed without very much thought. It seems to be in violation of the norms established by the Central Zoo Authority which state that animals should be exhibited in enclosures which best suit their nature.

RECOMMENDATIONS

1. The zoo should immediately stop breeding all animals.
2. There should be no further acquisition of big cats.
3. Immediate efforts should be made to enrich all the existing enclosures. An institution wide program of environmental enrichment should be developed and implemented.
4. The elephants should not be chained but instead should be given free access to their yard.
5. The reptile house and aquarium should be phased out. In the short term, enclosures should be properly equipped.
6. Aurangabad Zoo should rehouse the majority of its animal collection at other more appropriate facilities. The zoo should be modified into an extension of the gardens with a few species of herbivores being displayed in naturalistic paddocks.

BONDOLA ZOO

Goa—November 15, 2002

ANIMAL HOUSING & HUSBANDRY

Mammals

- WILD PIG:** Semicircular enclosure, 80 ft diameter. Soil substrate. Leaves, stones and trees. 5 ft high wall surrounding enclosure. Dirty water pool measuring approximately 5 ft x 6 ft. Attached shelter, 15 ft x 7 ft x 7 ft. in size. No food observed. 12 animals observed. Signboard present but no public stand-off barrier.
- ASIATIC ELEPHANT:** 100 ft x 45 ft yard. Soil substrate. Stones and trees present. 5 ft wide moat at rear of enclosure. One shed for mahout. No food observed. No pool or water facility. Two individuals observed, both chained. Animals used for rides and made to kneel on the concrete road. Signboard and barrier present.
- SAMBAR AND AXIS DEER:** 50 ft x 40 ft paddock. Soil substrate. Stones on interior floor surface and trees present. Water pool. One cement shelter with tiled roof, 8 ft x 8 ft x 8 ft. One cage measuring 15 ft x 9 ft inside enclosure. Browse inside. Eight Sambar and six Axis Deer observed.
- BLACKBUCK:** 30 ft x 90 ft enclosure. Soil substrate. Stones and trees. One cement shelter with asbestos roof measuring approximately 4 ft x 5 ft x 4 ft. Browse inside. No water. Three animals observed. Signboard and barrier present.
- SLOTH BEAR:** 80 ft x 50 ft open air enclosure. Sloping floor surface with soil substrate. Stones and trees inside. Depression in the substrate of the enclosure in the centre. Attached den. Two animals observed. No food or water observed. No signboard and barrier.
- GAUR:** Oval shaped paddock, major axis 150 ft. Sloping enclosure with soil substrate. Rocks, grasses and trees. Dry water pool, circular, approximately 8 ft in diameter.
- Browse observed. Five animals observed, one juvenile included. Signboard and barrier.
- LEOPARD:** 75 ft x 40 ft x 20 ft cage. Soil substrate. Grasses, trees and other vegetation inside. Logs in interior. Two attached dens. Mud water pot approximately 8 inches in diameter. No food observed in cage. One animal observed. Signboard and barrier present.
- JACKAL:** 16 ft x 7 ft x 8 ft cage. Cement substrate. Water facility approximately 1 ft x 1 ft. in size. One specimen observed. No signboard or barrier.
- LEOPARD:** 20 ft x 7 ft x 7 ft cage. Cement substrate. Wire roof with asbestos covering. Cement shelter. Circular water reservoir measuring approximately 6 inches in diameter. One attached den. One animal observed. Signboard and barrier present.
- SLOTH BEAR:** Circular pit type enclosure approximately 50 ft in diameter. Soil substrate. Trees in enclosure. One climbing structure made of wood and chain. 15 ft. wide dry moat surrounding enclosure. 10 ft. high wall surrounding pit. One water reservoir, 1 ft x 3 ft. Tap inside. One attached shelter with 2.5 ft x 1.5 ft entrance. No food observed. One animal observed. Signboard and barrier present.
- INDIAN PORCUPINE:** Circular pit type enclosure, 50 ft diameter. Soil substrate. Trees and bamboo clumps. No food or water observed. One animal observed. No signboard and barrier.
- PALM CIVET:** Hexagonal cage with 42 ft perimeter. Cage divided in six triangular sections. Each section equilateral with 7 ft sides. Cement floor. Tile roof. Logs and wooden ladders in cages. One bamboo shelter in cage. Three cages appeared empty. Four animals observed in the remaining three cages. No food or water in any of the cages.. Signboard and bamboo barrier present.

BARKING DEER: 30 ft x 50 ft paddock. Soil substrate with trees. Circular cement water reservoir, 1 ft in diameter. One cement hut with asbestos roof as shelter, 8 ft x 8 ft x 8 ft. No browse observed. One animal observed. No signboard and barrier.

INDIAN PORCUPINE: 20 ft x 15 ft open air enclosure. Cement substrate. Logs. One shelter. Water reservoir measuring 8 inches x 8 inches. Attached den. No food or water observed. Seven animals observed. No signboard and barrier present.

MOUSE DEER: 10 ft x 6 ft x 7 ft cage. Cement floor; dirty, soiled straw present. No browse and water. Cage extremely dark and dingy. One animal observed. No signboard and barrier.

Birds

PEAFOWL: 30 ft x 20 ft x 20 ft cage. Soil substrate. Potted plants and branches in cage. Water reservoir with tap. Attached shelter with cement floor and tiled roof. No food observed. Two birds observed, one male and one female. No signboard but barrier present.

Reptiles

MARSH CROCODILE: 20 ft x 30 ft pit. Soil substrate with stones. Trees and plants. Water pool, 8 ft x 10 ft. Two reptiles observed. Signboard and barrier present.

CHAMELEON: Circular pit approximately 10 ft in diameter and 10 ft high. Soil substrate. Thread netting on the roof. Stones and plants inside enclosure. Rusted wires inside enclosure. One animal observed. No signboard or barrier.

ROCK PYTHON: 7 ft x 7 ft x 6 ft cage. Cement floor. Wire roof with asbestos covering. One log inside. Mud water pot, 8 inches diameter. No live or dead food. Two snakes observed. Signboard and barrier present.

MARSH CROCODILE: 20 ft x 25 ft pit. Soil substrate and stones. Grasses and trees inside. Water pool, 10 ft x 6 ft. Eight crocodiles observed. Two Starred tortoises and one Flapshell Turtle also observed. No signboard but barrier present.

COBRA: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One small log. Light bulb inside. One snake and one live frog observed. Signboard and barrier present.

GREEN WHIP SNAKE: 3 ft x 3 ft x 2 ft enclosure with glass front and rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One upright bamboo stalk between two logs. Light bulb inside. One snake and one live frog observed. Signboard and barrier present.

RUSSELL'S VIPER: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One log. Light bulb inside. Two snakes and one live frog observed. Signboard and barrier present.

GREEN PIT VIPER: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One log. Light bulb inside. Two snakes and two live lizards observed. Signboard and barrier present.

BRONZE BACK TREE SNAKE: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear walls. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One upright bamboo stalk between two logs. Light bulb inside. One snake observed. Signboard and barrier present.

COMMON SAND BOA: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One log. Light bulb inside. Four snakes observed. Signboard and barrier present.

HUMP NOSE PITVIPER: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One log. Light bulb inside. Four snakes and three live lizards observed. Signboard and barrier present.

ORNAMENTAL SNAKE: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One upright bamboo stalk between two logs. Light bulb inside. Four snakes observed. Signboard and barrier present.

GREEN WHIP SNAKE: 3 ft x 3 ft x 2 ft enclosure with glass front and perforated rear wall. Two sides cemented. Sand substrate. Mud water pot, 8 inches in diameter. One upright bamboo stalk between two logs. Light bulb inside. Two snakes observed. No signboard but barrier present.

MARSH CROCODILE: 15 ft x 8 ft pit. 3 ft high wall surrounding enclosure. Soil substrate. Water pool, 10 ft x 7 ft. Some vegetation inside enclosure. One animal observed. No signboard and barrier observed.

COMMENTARY

Bondla Zoo is situated 55 km from the capital city of Goa, Panaji, so it is a 64 mile (110 km) journey from the nearest major tourist center. There is limited public transport so most zoo visitors must travel to the zoo by car.

Almost all the Bondla Zoo's enclosures are inadequate for the animals they contain. As well, the zoo's education and conservation efforts appear minimal, with the present zoo set up not being conducive to a broad range of education and conservation programming.

Visitor facilities are minimal or absent.

Size: Most of the enclosures are undersized.

Substrate: Predominantly natural earth, but cement substrates were observed in several enclosures.

Furnishings/Enrichment: Furnishings and environmental enrichment was very poor. In fact, in most cases there was no enrichment at all.

Educational Graphics: The educational graphics at this zoo were very poor. Little about the animals could be learned by reading the signboards.

Safety: Overall, the cages and the facility seemed secure. The investigators did not observe any serious safety concerns.

CONCLUSIONS

Bondla Zoo is a grossly substandard facility that should eventually be closed down. In the short term, to improve the lives of animals currently held at Bondla, a program of environmental enrichment should be developed and implemented.

RECOMMENDATIONS

These recommendations are only meant to provide some relief to animals currently held at Bondla Zoo. Eventually, the zoo should be closed.

1. Where possible, current cages and enclosures should be expanded.
2. All of the reptile cages, with the exception of the chameleon, are undersized and should be expanded.
3. A program of environmental enrichment should be developed and implemented for all animals.
4. Some of the ungulates might be considered for release into semi-wild situations, so this option should be examined on a case by case basis.
5. All breeding of animals at Bondla Zoo should be stopped.

BANNERGHATTA ZOO

Bangalore, Karnataka—August 17 – 18, 2002

INTRODUCTION

Bannerghatta Zoo is part of the Bannerghatta National Park set up in 1974 in Karnataka. It is situated 22 km from Bangalore city. The zoo is one section of the captive animal facility at the park. The zoo is located on 16 hectares of forest saddled between the Champakadhama Betta and Mirza hills. Bannerghatta National Park was the relocation destination of two groups of tigers from the Born Free Foundation in UK.

ANIMAL HOUSING AND HUSBANDRY

Mammals

SLOTH BEAR: Hexagonal cage with wire roof, 100 ft. perimeter by 10 ft. high. Metal rods just beneath roof. Logs inside. Narrow strip of land 8 ft in width and 10 ft high surrounding the main cage and forming a second cage. No environmental enrichment inside either of the cages. Dens attached in both cages. No food and water observed in either cage. Mud substrate in both cages. Five Sloth Bears in the main cage. One animal circling continuously. Two Himalayan Black Bears in the narrow cage. All the bears of both species are rescued animals. The Sloth Bears were rescued from street performers and the Himalayan Black Bears from a circus. Signboard only for Sloth Bear. Barrier present. People observed disturbing animals.

JUNGLE CAT: 10 ft x 12 ft x 10 ft cage. Asbestos roof and cement substrate. Ten hollow constructions on the wall. One log. No food but water container on the floor. One animal observed sleeping. Signboard present but no barrier.

SMALL INDIAN CIVET: 10 ft x 12 ft x 10 ft cage. Asbestos roof and cement substrate. Ten hollow constructions on the wall. One log on floor and one bamboo log hanging from the roof. No food but water

container on the floor. Two animals observed sleeping. Signboard present but no barrier.

MITHUN: Open air enclosure measuring approximately 150 ft x 150 ft. Grass and trees in enclosure. Two sheds with food and water troughs. Two animals observed. Signboard and barrier absent.

LEOPARD: 110 ft x 90 ft x 20 ft cage. Mud substrate. Logs on ground surface and 15 living trees inside. Two dens attached. Four shelters. No food or water observed. Six animals observed, the majority of them pacing. Signboard and barrier present.

GRANT'S ZEBRA: Open air enclosure, 300 ft x 90 ft with 8 ft high surrounding fence. Soil substrate with rocks. Trees and grass growing inside. One water reservoir. Food trough noticed. Three shelters, 8 ft x 8 ft x 8 ft. Two animals. Signboard and barrier absent. People observed poking animals.

JACKAL: Octagonal cage, 64 ft in perimeter and 12 ft high. Mud substrate with holes on the floor. One log inside. One attached den. Two animals observed, both stereotypically pacing in a figure eight pattern. Food and water absent. Signboard absent but barrier in front of cage.

RHESUS MACAQUE: Octagonal cage, 64 ft in perimeter and 12 ft high. Soil substrate. One upright iron rod in the center of cage. Three dead logs and one hanging tire inside. One attached den, 8 ft x 7 ft. in size Food scattered on the ground. No water. Four animals observed. Signboard and barrier absent.

ASSAMESE MACAQUE: Octagonal cage, 64 ft in perimeter and 12 ft high. Cement substrate. Two metal rods and three logs inside. One den measuring approximately 4.5 ft x 4.5 ft. attached to cage. One hanging tire. Food scattered on the ground. One animal observed

continuously pacing the perimeter of the cage fencing. No signboard and barrier present.

CAPPED LANGUR: Octagonal cage, 64 ft in perimeter and 12 ft high. Cement substrate. One metal rod; one tire and one bamboo log hung from the roof. Two shelters, one 3.5 ft x 2 ft, the other 7 ft x 5 ft. One wooden plank and a long rope inside cage. Food scattered on the floor but no water. One animal observed huddled near the roof of the enclosure. Obviously the animal wanted some privacy. Signboard inside cage, but no barrier.

STRIPED HYENA: Octagonal cage, 64 ft in perimeter by 12 ft high. Cement substrate. Two attached dens, one 5.5 ft x 4 ft x 3 ft.; the other, 8 ft x 6 ft x 6 ft. Two logs and two metal rods inside. No food and water observed. One animal observed. The animal looked old and was observed limping. No signboard or barrier present.

ASIAN ELEPHANT: Six animals, attended by their attendant mahouts. One tusker and one young. Mahouts goading animals with iron rods to salute visitors. One low barrier separating animals from public but animals reaching out directly to people. People observed feeding animals and touching them. No signboard present.

RHESUS MACAQUE: Octagonal cage, measuring approximately 64 ft in perimeter and 12 ft high. Cement substrate. One tire and two metal rods observed. One attached cement den, 5 ft x 4 ft. Food scattered on the ground. No water. One animal observed. No signboard.

HIPPOPOTAMUS: 40 ft x 70 ft x 8 ft enclosure, divided into three cubicles. Three water facilities: one measured 10 ft x 15 ft.; the second was triangular with sides of 18 ft, 20 ft and 8 ft; and the third also triangular, with sides of 20 ft, 25 ft and 15 ft long. Three animals observed, two adults and one juvenile. Signboard and barrier present.

MALABAR GIANT SQUIRREL: 8 ft x 8 ft x 8 ft cage. Cement substrate. Two metal rods and three logs inside cage. One wooden box as shelter. One animal. Signboard and barrier present.

WILD BOAR: Circular enclosure, 90 ft in circumference. Rock substrate. Two trees inside enclosure. One water

reservoir. One elevated area inside with bamboo clumps. One animal. Signboard present but no barrier.

INDIAN PORCUPINE: Circular enclosure, pit type, 90 ft in circumference. 6 ft high wall with 5 ft high fencing on top. Cage floor made of stone. Six shelters. One water reservoir. Food scattered on the cage floor. Five animals. Signboard present but no barrier.

Birds

ALBINO PEAFAWL: 40 ft x 16 ft x 18 ft cage. Soil substrate. Trees and branches. Rock shelter. Dry water reservoir inside. Two birds observed, one inside shelter. Signboard present, but no barrier.

DOMESTIC GOOSE: Circular enclosure, 60 ft in circumference. Cement mound inside cage. 7 ft high wall with 5.5 ft high fencing on top. Very shallow water inside. Food scattered on mound. Ten birds observed. Signboard and barrier absent.

PIGEON: Five enclosures, each 10 ft x 10 ft. Branches inside. Many birds observed; exact number not counted.

BLACK HEADED MUNIA: 10 ft x 10 ft x 8 ft cage with asbestos roof. Cement substrate. One dry branch inside. Fourteen nesting pots. Straw provided as nesting material. Food and water on the cage floor. Forty Black Headed Munias and one Japanese Quail noticed. Signboards absent.

BLACK HEADED MUNIA & GREY PARTRIDGE: 10 ft x 8 ft x 10 ft cage with asbestos roof. Cement substrate. One branch and thirteen nesting pots in cage. Straw present as nesting material. Food and water presented on the ground. Fifteen Black Headed Munias and two Grey Partridges observed. Signboard for Grey Partridge only.

BUDGERIGAR: 10 ft x 8 ft x 10 ft cage with asbestos roof. Cement substrate. One branch. Thirty six nesting pots. Food and water on the ground. Ten birds observed.

WEAVER BIRD: 10 ft x 8 ft x 10 ft cage with asbestos roof. Mud substrate. One branch inside. Five nesting pots inside. Straw and plastic provided as nesting material. Fifteen birds observed. The birds have built nests themselves although the desirability of plastic as nesting material should be questioned. Food and water provided on the ground. Signboard absent.

BLACK HEADED MUNIA & GREY PARTRIDGE: 10 ft x 8 ft x 10 ft cage with asbestos roof. Cement substrate. One branch. Straw nesting material provided. Eight nesting pots inside. Fifty Black Headed Munias and two Grey Partridges observed. Signboards absent.

BUDGERIGAR: 10 ft x 8 ft x 10 ft cage with asbestos roof. Cement substrate. One branch. No nesting material provided. Food and water on the floor. Around one hundred birds counted. Obvious overpopulation in such a small area. Signboard present.

BARN OWL: 10 ft x 12 ft x 10 ft cage with cement wall at the back of enclosure. Asbestos roof. Cement substrate. Some hollow structures in the wall. Cement water pot on floor. No food observed inside. One Barn Owl observed. Plastic sheet in front of cage for privacy. Signboard and barrier absent.

BARN OWL: 10 ft x 12 ft x 10 ft cage with cement wall at the back of enclosure. Asbestos roof. One bamboo stalk hanging from roof. Cement substrate. Some hollow structures in the wall. Cement water pot on floor. One Barn Owl observed. Plastic sheet in front of cage to provide privacy. Signboard present but no barrier.

MOTTLED WOOD OWL: 10 ft x 12 ft x 10 ft cage with cement wall at the back of enclosure. Asbestos roof. One bamboo stalk hanging from roof. Cement substrate. Two logs on floor. Twelve hollow structures in the wall. Cement water pot on floor. No food observed inside. Two birds observed. Plastic sheet in front of cage for privacy. Signboard present but no barrier.

AVIARY: Circular cage approximately 350 ft in circumference and 20 ft high. Stony surface inside and water pool present. Living trees inside. Numerous birds observed including Painted Stork, Spoonbill, Pond Heron, Purple Moorhen, Grey Pelican, Tufted Pochard, Brahminy Duck, Bar-Headed Goose. Barrier and signboards present.

PEAFOWL: 50 ft x 30 ft x 25 ft cage. Soil substrate. One cement shelter. Five living trees. Fourteen mud pots inside. Dry water reservoir. Bamboo log noticed hanging from roof. Ten birds observed. Signboard present.

RED CRESTED POCHARD: Circular enclosure, 90 ft in circumference and having 5 ft high wall with 5 ft high fencing on top. Stone shelter. Water pool. Six birds observed. No signboard.

ROSE RINGED PARAKEET: 20 ft x 10 ft x 8 ft cage. Soil substrate. Two bamboo perches. Food and water on the floor. Fourteen birds observed. Signboard present.

ALBINO PEA FOWL: 20 ft x 10 ft x 8 ft cage, walled at the back. Soil substrate. Four boxes inside. Three bamboo perches hanging from roof. Food and water offered on the cage floor. One bird observed lying on the floor. No signboard.

LARGE INDIAN PARAKEET: 20 ft x 10 ft x 8 ft cage walled at the back. Two nesting boxes on the wall. Four bamboo branches. Food and water provided on the floor. Five birds observed. Signboard present.

DOMESTIC PIGEON: Nine cages, each 8 ft x 8 ft x 8 ft. Cages having cement substrate and asbestos roof. Different breeds exhibited with around thirty birds displayed in each cage. Signboards present.

GREAT INDIAN HORNBILL: Two enclosures, each 15 ft x 10 ft x 10 ft. One bamboo perch and one metal rod observed in both the cages. Mud substrate in both cages. Food and water offered on the floors of both the cages. Two birds, one in each cage. Signboard and barrier present.

COMMON QUAIL: 15 ft x 15 ft x 10 ft cage. Mud substrate. Two metal rods inside. Dry water reservoir. Two birds. Signboard absent but barrier in front of cage.

CHINESE SILVER PHEASANT: 15 ft x 10 ft x 10 ft cage. Two metal rods and two mud shelters on the floor. Food and water on the ground. One male bird. Signboard and barrier present.

GREY JUNGLE FOWL: Two interconnected cages, each 15 ft x 10 ft x 10 ft. Mud substrate. Two metal rods in each cage. Food and water presented on the ground. One shelter. Two birds observed. Signboard and barrier present.

RING NECKED PHEASANT: 20 ft x 35 ft x 10 ft cage. Sand substrate. Shelter inside. Two birds observed. Signboard and barrier absent.

Reptiles

COBRA: Circular pit approximately 70 ft in circumference. Pit surrounded by 5 ft high wall with 5 ft high fencing above. Earth mound as enclosure floor. Three sheds

provided for privacy. Trees, branches and bamboo clumps situated in cage. One water reservoir. No snakes observed. Signboard present but no barrier.

WATER MONITOR: Pit-style enclosure measuring about 25 ft x 18 ft x 12.5 ft. Mud substrate and live vegetation. Two water reservoirs about 8 ft x 8 ft each. One asbestos shelter, 2.5 ft x 1 ft. One reptile observed. Signboard and barrier absent.

GHARIAL: Circular pit approximately 160 ft in circumference. Earth substrate. Bamboo clumps inside. One water reservoir made of stones. Three reptiles. Signboard absent.

SPECTACLED CAIMAN: Pit-style enclosure measuring approximately 35 ft x 35 ft with 4 ft high wall. Mud substrate. Six trees and bamboo clumps. Circular water reservoir about 25 ft diameter; very little water (maximum depth of 6 inches). Thirty four animals counted. Signboard present but no barrier.

MARSH CROCODILE: Circular pit, 275 ft in circumference with 5 ft high wall. Mud substrate. Rock construction holding earth, 5 ft in height, in the middle of the water reservoir. Bamboo growing on this construction. Water depth in reservoir is 1 ft. Trees and bamboo growing inside the enclosure on the earth substrate. One reptile observed. Signboard and barrier present.

STAR TORTOISE: Pit-style enclosure approximately 90 ft in perimeter. Soil mound present. Two water pools; one measuring 5 ft x 3 ft and the other about 1 ft x 2.5 ft. Trees inside. Food provided on cement slabs. Eleven tortoises noticed. Signboard present but no barrier.

COMMON INDIAN MONITOR LIZARD: Circular enclosure about 75 ft in circumference. Soil substrate. Trees inside. Rock shelter. Water pool, 1 ft x 2 ft, with 2 inches deep water. Four lizards observed. No signboard and barrier.

GREEN IGUANA: Pit-style enclosure measuring 100 ft in circumference. Hard, dry soil substrate. Soil mound inside. One circular water facility, 3 ft in diameter, with 4 inches deep water. Two rock shelters, each 1.5 ft x 2.5 ft. Food provided on plastic trays. Six lizards observed. Signboard present but no barrier.

CHECKERED KEELBACK WATER SNAKE: Circular pit, 100 ft in circumference. 5 ft high wall with 5 ft high fencing on top. Soil substrate. Two water reservoirs, one dry and one with water 4 inches deep. Three trees and bamboo clumps. Four snakes observed. Signboard present but no barrier.

KING COBRA: Circular pit, 120 ft in circumference. Soil mound inside with grass. Two trees and bamboo clumps. One stone shelter. One water reservoir. Four snakes observed. Signboard and barrier present.

ROCK PYTHON: Pit, 100 ft in perimeter with wire netting as roof. Soil mound inside with grass. One water pool, 6 ft x 3 ft, having 4 inch deep water. Bamboo logs as climbing frames. Four snakes observed, two on branches and two on the ground. No barrier but signboard present.

RUSSELL'S VIPER AND RED SAND BOA: Circular pit, 85 ft in circumference. 5 ft high wall with 5 ft high fencing. Soil mound inside. Mud pots within soil. Trees inside. Rock shelter. Water pool, 1 ft x 2.5 ft, 2 inches deep water. One Russell's Viper and one Red Sand Boa observed. Signboards present but no barrier.

COMMENTARY

Bannerghatta Zoo does not appear to serve any meaningful function as an education, conservation or research center, but instead seems to be focused on visitor entertainment. The zoo is a popular picnic spot and there is a funfair located just outside the zoo gates. Educational graphics are grossly inadequate or absent, many animals are housed singly and stereotypic behaviours are common. In its present state, it is doubtful the zoo could serve a more serious and legitimate purpose.

RECOMMENDATIONS

1. All social animals currently kept singly should be provided with appropriate companionship or moved to more socially-acceptable accommodation elsewhere.
2. The single Malabar Giant Squirrel and the Striped Hyena should be released or sent to another zoo. There is a single Striped Hyena in Shimoga Zoo. Perhaps this animal should be shifted to Shimoga or that animal brought here. However, only shifting

animals without making discernible improvements to their living conditions will not serve to improve their welfare.

3. The monkey cages should be improved as soon as possible.
4. A program of environmental enrichment for all animals should be developed and implemented.
5. Using elephants as entertainers sends the wrong kinds of messages to the public, so the shows should be stopped.
6. The aquarium displays are unnecessary and should be phased out. There is also little need to display common bird species such as Rose-ringed parakeets, budgerigars and geese, so consideration should be given to phasing out these displays as well.
7. The zoo should stop breeding all animals.
8. The zoo should use the present museum and add more non-animal modes of communication to create an educational function.
9. The forest department should consider phasing out the zoo altogether.

CALCUTTA SNAKE PARK

Badu, West Bengal—June 4, 2002

INTRODUCTION

Calcutta Snake Park is a private facility owned by Dipak Mitra, a resident of Calcutta. The following report outlines the conditions in the park as observed on June 4, 2002. According to one of the Zoo's signboards, Calcutta Snake Park was inaugurated by Parimal Mitra, Minister in Charge of Forests and Tourism, Government of West Bengal and Ram Chatterjee, Minister in Charge of Civil Defence, Government Of West Bengal, on October 2, 1977. The Zoo is quite small, spread over an area of about 2-3 acres. It is claimed as a conservation centre and a snake venom research laboratory. This report tries to cover as many aspects of the facility as possible.

ANIMAL HOUSING AND HUSBANDRY

Mammals

MACAQUE: This monkey cage is 5.5 ft x 2.5 ft x 8 ft in size.

It was extremely dirty with left over food and animal excreta. The exact species of the lone animal in this cage could not be ascertained, but it is possibly a Rhesus Macaque. There is no attempt at environmental enrichment. There is no privacy from public view. Only rotten fruits and vegetables observed as food on the cage floor. No water observed. Animal seen biting bars. The inside of the exhibit is extremely dark due to limited amount of sunlight that enters the cage. Barrier fencing present in front of cage. Animal observed being taunted by visitors. The flooring of the cage was cement.

CIVET: Appears to be a Common Palm Civet. One animal observed. Animal extremely emaciated and eyes watering. 3 ft x 1.5 ft cage. Food and water provided. Animal observed sitting and seemed to turn its head around with great effort. Cage situated inside a dark room. Animal possibly rescued and then incarcerated here. Coat lacks the sheen of healthy, active animals. Matted

with dirt and feces in places. Jagged wires protruding inside the cage. Cage wires rusting.

MACAQUE: Two monkeys, probably Rhesus macaques. Cage dimension approximately 5 ft x 5 ft x 7 ft. No attempt at environmental enrichment. Floor of the cage extremely filthy. Wires of the cage rusting. One animal performing stereotypic behaviour in the form of repeated pacing and circling. Stereotypic circling was observed for fifteen minutes. Monkey performing stereotypy appears to have a deformed spine (arched). The other animal was observed sitting. No food or water observed. No privacy area or shelter to get away from prying eyes of visitors. Cage seems extremely dark with very little sunlight. Jagged wire ends protruding on the inside of the wire mesh.

AXIS DEER: Enclosure approximately 12 ft x 7 ft. Mud substrate. A 8 ft x 7 ft hut is attached to this enclosure. One animal observed inside. There is no vegetation in the enclosure. Reportedly, this single animal has been enduring the same conditions for at least ten years. One of the investigators visited this snake park ten years ago and had observed this deer living in the same cage. If this is indeed the same animal, it appears as though no attempt has been made to relocate the animal to a better enclosure elsewhere or to provide it with an appropriate social environment with other deer. Photos of the animal were taken with difficulty since the interior of the hut was extremely dark. This is one of the worst enclosures encountered during the Indian Zoo inquiry. No food, browse or water was observed. Visitors were observed shouting, screaming and mocking the animal.

Birds

COCKATIEL: Cage beneath Wolf snake enclosure. Twenty-six birds in cage measuring 2 ft x 2 ft x 4 ft. No food or water was present. No branches or other furnishings. Cage was filthy with bird droppings. Some of the birds

had feathers soiled with excreta. The cage appeared grossly overcrowded with birds jostling for very limited space. No nesting material or boxes.

BUDGERIGAR: Cage situated beneath a python exhibit. Measured approximately 3.5 ft x 1.5 ft x 2.5 ft in size. Eleven animals observed. A few dry, dirty sticks offered. No food or water observed. Cement cage with cement flooring. No signboard on enclosure wire. Cage extremely dirty with unwashed excreta soiling the floor. No privacy for birds to remove themselves from public view.

JAVA SPARROW: Cage situated beneath empty King Cobra cage. Same dimensions as budgerigar cage. One dry twig inside as perch. Eleven birds observed. No food or water observed. Cage floor extremely dirty with feces. No signboard.

LOVEBIRDS: Cage signboard says 'Lutino Lovebird and Peach Faced Lovebird'. Investigators not aware of any lovebird species named as Lutino Lovebird. There are 9 birds. There were four Peach Faced Lovebirds and five birds with whitish grey colouring on throats (same area which is red in the normal Peach Faced Lovebirds). Whether these birds are a mutation of the normal coloured Peach Faced Lovebird or a different species is not known. Cage measured approximately 3.5 ft x 1.5 ft x 2.5 ft. Two dry sticks; no other furnishings present. Cage floor soiled with excessive build-up of excreta. No privacy from public view. No food or water observed.

ALBINO COCKATIELS: Cage signboard says 'Fischer's Lovebird'. Conditions similar to previous bird cage descriptions. No food or water observed. Five birds housed in cage.

TURKEY: 5 ft x 5 ft open air cage. Seven white turkeys observed feeding. Natural soil substrate. Cage appeared too small for the birds to move around freely.

BUDGERIGAR: 4 ft x 2.5 ft x 2.5 ft cage. Twenty-eight birds counted. No perches, branches or boughs provided. Cage extremely filthy. One dead bird was noticed on the cage floor. Another bird was lying on top of the dead bird, pecking its body.

COCKATIELS: Cage situated beneath Rock python cage. Measured about 4.5 ft x 2 ft x 2 ft. Seven birds observed.

ROSE-RINGED PARAKEET: Cage measured approximately 5 ft x 2 ft x 3 ft. One branch inside. No food or water observed. Two adult birds observed; one male and one female.

COCKATIEL: Cage situated beneath King cobra exhibit. Measured approximately 4.5 ft x 2 ft x 3 ft. Seven animals observed. No branches or other furnishings. Cage floor soiled with excreta. No food and water observed. Feathers of all birds soiled with excreta.

FANTAIL PIGEON: Two birds observed. Wire cage measuring approximately 2.5 ft x 1.5 ft x 1.5 ft. No food or water observed.

Reptiles

ROCK PYTHON: 3.5 ft x 1.5 ft x 2.5 ft cage. Glass front. No environmental enrichment observed. The enclosure sign identifies the snake as a 'Water Python'. The proprietor received a python from Malaysia that had been rescued from a stack of logs imported to India. The title 'Water Python' might apply to that Malaysian snake, which may be a subspecies of the Rock python. Cement flooring; no soft substrates present. Three snakes observed. No food or water in view. Barrier present.

KING COBRA: Empty cage. 3.5 ft x 1.5 ft x 2.5 ft. Cement walls and flooring. No animal observed.

KING COBRA: Empty cage. Same as previous King Cobra exhibit. Wooden shelter box inside. No animal observed.

MONOCELLATE COBRA: Cement cage measuring approximately 3.5 ft x 1.5 ft x 1.5 ft with glass front. Two animals observed coiled together. No food or water observed. No branches or furnishings. Cement flooring.

RUSSELL'S VIPER: Wooden cage approximately 1.5 ft x 1.5 ft x 1 ft in size with glass front. Two animals observed. No food or water, although there was an empty water bowl in the exhibit. No branches or other furnishings.

STARRED TORTOISE: Open air enclosure with mud substrate measuring approximately 4 ft x 4 ft. No shelter from the rain. Five adult animals observed. No food or water observed. No enclosure barrier.

BANDED KRAIT: Open air, pit-type enclosure measuring approximately 8 ft x 10 ft x 3 ft. Some living vegetation inside. One animal observed lying inside a mud pot that was provided as shelter. No food or water observed.

MARSH CROCODILE: Five crocodiles observed in pool exhibit measuring about 8 ft x 10 ft x 3 ft. No food observed. Terrestrial area has soil substrate. Barrier fencing present.

BRONZEBACK TREE SNAKE: One animal observed in wooden cage, with glass front, measuring approximately 2.5 ft x 1 ft x 1 ft. No branches or furnishings. No food and water observed.

RUSSELL'S VIPER: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No environmental enrichment. One animal observed.

STRIPED KEELBACK SNAKE: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No twigs, branches, leaves or furnishings. Four animals observed. No food or water present. Barrier fencing in front of cage.

WOLF SNAKE: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No furnishings. One animal observed. No food or water in exhibit. Barrier fencing in front of cage.

TUCTOO GECKO: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No furnishings. One animal observed. No food or water observed. Barrier fencing in front of cage.

COMMON SAND BOA: Two animals observed in 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No furnishings. No food or water noticed. Barrier fencing in front of cage.

OLIVE KEELBACK WATER SNAKE: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No furnishings. One animal. No food or water observed. Barrier fencing in front of cage.

COMMON KRAIT: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No furnishings. One animal in exhibit. No food or water observed. Barrier fencing in front of cage.

BANDED KRAIT: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No furnishings. One animal observed. No food or water present. Barrier fencing in front of cage.

COMMON WATER SNAKE: 2.5 ft x 1 ft x 1 ft wooden cage with glass front. No furnishings. One animal observed. No food or water present. Barrier fencing in front of cage.

ORNAMENTAL SNAKE: Cage, 2 ft x 2 ft x 4 ft wooden holding facility with glass front. A single snake was observed. No food or water noticed. Barrier fencing present in front of cage.

MONOCELLATE COBRA: 2 ft x 2 ft x 4 ft wooden holding facility with glass front. A single snake was observed. No food or water present. Barrier fencing present in front of cage.

RUSSELL'S VIPER: Wooden cage measuring approximately 1 ft x 1.5 ft x 2.5 ft with glass front. One snake observed. No furnishings or environmental enrichment. No food or water present.

RAT SNAKE: Cage measures approximately 1 ft x 1.5 ft x 2.5 ft. Wooden floor and glass front. No furnishings. No food or water present. Broken barrier in front of this cage.

SPECTACLED COBRA: Cage approximately 1 ft x 1.5 ft x 2.5 ft. Wooden floor and glass front. No furnishings. No food or water present. No barrier in front of cage.

COMMON KRAIT: Cage approximately 1 ft x 1.5 ft x 2.5 ft. Wooden floor and glass front. One animal observed. No furnishings or environmental enrichment. No food or water present. Barrier fencing in front of cage.

VINE SNAKE: Cage measures approximately 1 ft x 1.5 ft x 2.5 ft. Wooden floor and glass front. One animal observed. No furnishings or environmental enrichment. No food or water present. Barrier fencing in front of cage.

RED SAND BOA: Cage signboard says 'Red Boa'. Cage measures approximately 1 ft x 1.5 ft x 2.5 ft. Wooden floor and glass front. One animal observed. This is a burrowing snake, so the dry wooden floor cannot suit the behavioural needs of the reptile. No furnishings or environmental enrichment. No food or water present. Barrier fencing in front of cage.

JAPANESE QUAIL: Signboard says 'Farm Quail'. Cage approximately 2 ft x 2.5 ft x 4 ft in size; situated beneath Red sand boa exhibit. Three birds observed. Food present, but water bowl empty.

ORNAMENTAL SNAKE: Cage approximately 1 ft x 1.5 ft x 2.5 ft in size. Wooden floor and glass front. No environmental enrichment. No food and water observed. Barrier fencing in front of cage.

WATER MONITOR: Pit type enclosure approximately 4 ft x 8 ft x 6 ft in size. A mud pit-like shelter inside. Two animals observed; one in mud pit shelter and the other in a shallow, triangular water reservoir. The sides of the water reservoir measured approximately 2 ft, 3 ft and 4 ft. The water appeared to be a murky, yellowish brown colour. It must be noted that the water reservoir does not accommodate the large size of the animals incarcerated. No vegetation inside cage. No food observed. No water bowl or facility for drinking water, apart from the reservoir.

YELLOW MONITOR: Pit type enclosure approximately 8 ft x 15 ft x 4 ft in size. Three water facilities inside. Two about 2 ft x 5 ft and the third about 4 ft x 7 ft in size. Tile shelter inside cage. Four animals observed. Three inside the tile hut and one in the 4 ft x 7 ft pool. A small shelter made of bamboo was also provided. No vegetation inside enclosure. No food or water observed.

MARSH CROCODILE: Large grassy enclosure measuring approximately 20 ft x 40 ft. Two water pools, each about 4 ft x 8 ft in size. The pools are filled with leaves, bamboo branches and dirt. Five animals observed; two in water and three basking in the sun.

CHECKERED KEELBACK: 4 ft x 8 ft x 6 ft pit with vegetation. No live animals observed, but a dead, rotting snake was lying on the cage floor. Cage full of shrubs. Wire fencing on top.

SPECTACLED COBRA: 2 ft x 1 ft x 1.5 ft wooden cage with glass front. One animal observed. No furnishings or environmental enrichment. No food or water observed. Animal appeared emaciated with dry and flaky skin.

CHECKERED KEELBACK: 2 ft x 1 ft x 1.5 ft wooden cage with glass front. Animal observed lying inside water bowl. No food inside cage.

RUSSELL'S VIPER: 2 ft x 1 ft x 1.5 ft wooden cage with glass front. One animal observed. No furnishings or environmental enrichment. No food or water observed.

GREEN WHIP SNAKE: 2 ft x 1 ft x 1.5 ft wooden cage with glass front. One animal observed. No furnishings. Animal seemed emaciated with dry and flaky skin. Spine of the snake could be observed sticking out.

MONOCELLATE COBRA: 2 ft x 1 ft x 1.5 ft wooden cage with glass front. One animal observed. No furnishings. No food or water observed

COMMON KRAIT: 2 ft x 1 ft x 1.5 ft wooden cage with glass front. One animal observed. No furnishings. No food or water observed. Animal extremely lean.

RUSSELL'S VIPER: 2 ft x 1 ft x 1.5 ft wooden cage with glass front. One animal observed. No furnishings. No food or water observed.

CHECKERED KEELBACK: Pit type cage 10 ft x 4 ft x 3 ft in size, filled with water with chickweed. Ten animals observed; only mouths protruding out of the water. No dry areas in this exhibit.

LAND MONITOR: Empty mud pit. A very narrow water reservoir inside. Cage size approximately 7 ft x 4 ft x 5 ft.

MONOCELLATE COBRA: 10 ft x 4 ft x 3 ft cement cage with glass front. One dry twig provided Three animals observed. A plastic water bowl situated inside cage.

SPECTACLED COBRA: 10 ft x 4 ft x 3 ft cement cage with glass front. One dry twig provided. One animal observed inside.

RAT SNAKE: 10 ft x 4 ft x 3 ft cement cage with glass front. Three animals observed. A plastic water bowl situated inside cage.

ROCK PYTHON: 10 ft x 4 ft x 3 ft cement cage with glass front. No furnishings. Three animals observed. A plastic water bowl situated inside cage.

MARSH CROCODILE: Mud pit measuring approximately 15 ft x 15 ft x 4 ft with three animals inside. A water pool measuring 3 ft x 7 ft. Narrow drain on three sides of the enclosure.

WATER MONITOR: 10 ft x 15 ft x 4 ft cement pit with one small shelter. Like the previous Marsh Crocodile enclosure, there is a narrow drain on three sides of the pit. This drain is filled with brown, smelly, dirty water. Six animals observed; several swimming in the drain.

YELLOW MONITOR: 7 ft x 10 ft x 3 ft mud pit enclosure. Five animals observed inside burrows in the cage floor. A small wooden hut provided as shelter. No food or water observed.

ROCK PYTHON: 4.5 ft x 2 ft x 2 ft cement cage with glass front. No animals observed. A wooden shelter box situated in the cage.

KING COBRA: 4.5 ft x 2 ft x 2 ft cement exhibit with glass front. No furnishings. One snake observed. No food or water present.

COMMENTARY

This Zoo appears shoddy, poorly managed and pays little attention to the biological and ethological needs of many of its animals. It seems to be a primarily commercial enterprise that has no relevance to wildlife conservation or public education. It would be hard-pressed to satisfy the conditions laid down for the proper functioning of Zoos by the Central Zoo Authority.

The entire facility looks shabby and many areas have a pungent, putrid smell. Enclosures give the impression of having been built in a haphazard manner. The lack of coordinated planning was evident throughout the Zoo grounds.

There was absolutely no attempt to environmentally enrich the animal exhibits to encourage natural movements and behaviours. Most were devoid of functional furnishings.

Where food was observed, it appeared to have been tossed inside or scattered, much of it exposed to or mixed with animal excreta. Most of the snakes seemed to be extremely lean with dry skin and protruding bones.

Very few keepers were observed on the Zoo grounds, so supervision was minimal. There was no map to guide visitors. Enclosure signboards seemed in various stages of decay and all too often conveyed inaccurate information. No keeper talks were observed, although they reportedly take place, according to local people who were interviewed about conditions at the Zoo. When keepers were encountered, they seemed reticent to talk about the Zoo. Educational leaflets were sold to visitors, but they were very basic, providing nothing but the names and some simple, very general information about snakes.

Public facilities in the Zoo are lacking, except for a single dirty toilet and a snack shop. There appeared to be no first aid facility in the event of an accident or emergency situation.

Barrier fencing is made out of bamboo and is broken in places. Some of it obstructs the view of the animals.

According to area residents, there have been instances of crocodiles escaping from this facility.

There have been many complaints about this Zoo. Having reviewed its conditions, it is surprising that the Calcutta Snake Park is granted accreditation by the Central Zoo Authority year after year. Complaints against this Zoo resulted in a video recording by a media team for a series focusing on animal welfare. The elder brother of the owner, Ramprasad Mitra, who operates another snake park nearby, spoke with one of the investigators. He said that his brother must be aware of the bad conditions in his private facility.

The proprietor, Dipak Mitra, has snake parks elsewhere in West Bengal which are equally problematic. One of them, located in Digha, was constructed illegally without the permission of the Central Zoo Authority. Complaints to the Forest Department by animal welfare organizations have not resulted in any substantive action. Reportedly, the Central Zoo Authority had asked for an explanation from the state Forest Department regarding the proprietor's Digha Snake Park, but failed for reasons unknown. Presently, the Digha Snake Park is defunct.

Calcutta Snake Park supplies snake venom to several scientific institutions, so it is possible the Forest Department sees some value in this activity. However, this does not justify leniency in dealing with its substantive animal welfare problems. There is no reason for snakes (and other animals) to be kept in barren, biologically irrelevant environments. In a facility with so many wide-ranging deficiencies, it is hard to imagine any legitimate conservation, education or research function.

RECOMMENDATIONS

1. Considering the numerous, serious deficiencies at Calcutta Snake Park, the Central Zoo Authority of India and the Forest Department of West Bengal should close this facility down and relocate the animals to more appropriate accommodation elsewhere.

DARJEERLING ZOO

Darjeeling, West Bengal—June 9 – 10, 2002

INTRODUCTION

Darjeeling Zoo (or Padmaja Naidu Himalayan Zoological Park) is situated at an elevation of 2133.5 metres against the backdrop of the Kanchenjunga mountain range. It was established on August 14, 1958 under the Department of Education of West Bengal for study and conservation of Himalayan fauna. On November 21, 1975, the Zoo was dedicated by Mrs. Indira Gandhi, former Prime Minister of India, to the memory of Mrs. Padmaja Naidu, former Governor of West Bengal. The Zoo has approximately 100 animals representing about 30 species.

This Zoo has made efforts to breed Red Pandas, Snow Leopards and Tibetan Wolves.

ANIMAL HOUSING AND HUSBANDRY

Mammals

RED PANDA: 15 ft x 15 ft x 10 ft cage with wire netting.

Earth substrate. Wooden nesting box and a plastic traveling crate inside. Food and water observed. Bamboo stems offered as food. Two animals were observed. Both adult animals. Barrier fencing in front of cage. Signboard present.

RED PANDA: 15 ft x 15 ft x 10 ft cage with wire netting.

Earth substrate. Wooden nesting box and a plastic traveling crate inside. Food and water observed. Bamboo stems offered as food. Two animals were observed. Both adult animals. Barrier fencing in front of cage. Signboard present. A large den is attached to this enclosure. Animals observed sleeping together.

HIMALAYAN PALM CIVET: 10 ft x 12 ft x 10 ft cage.

Cement cage with wire front. Shelf inside. Menagerie-style cage housing leopards previously. Very dim environment. Water bowl inside. Two animals observed.

One animal stereotyping (pacing). Another animal sleeping on a perch. Two logs inside. Signboard and barrier fencing in front of cage. Zoo staff informed there are three animals in Darjeeling Zoo, two males and one female.

HIMALAYAN PALM CIVET: 10 ft x 12 ft x 10 ft cage.

Cement cage with wire front. Shelf inside. Menagerie-style cage housing leopards previously. Very dim cage environment. Water bowl inside. One animal observed sleeping on perch. Two logs inside. Signboard and barrier fencing in front of cage.

SLOW LORIS: 10 ft x 12 ft x 10 ft cage. Cement cage with

wire front. Shelf inside. Menagerie style cage housing leopards previously. Very dim cage environment. Water tray inside. Two logs inside. Signboard and barrier fencing in front of cage. No animals were observed. Zoo staff informed there are two animals, both males.

RED PANDA: Sloping enclosure tapering at one end. 30 ft

long and 12 ft high. 10 ft wide at narrowest point and 18 ft wide at widest point. Earth substrate and wooden branches provided. Attached den. Double netting. One animal observed clinging to mesh wire. No food or water observed. No vegetation inside. Barrier fencing in front of cage. Signboard absent.

RED PANDA: Sloping enclosure tapering at one end. 30 ft

long and 12 ft high. 11 ft wide at narrowest point and 18 ft wide at widest point. Earth substrate and wooden branches provided. No vegetation inside. Food (fruits) and water inside the cage. Two wooden shelters. Double netting. Three animals observed. Railing in front of cage. Signboard absent.

RED PANDA: Semi circular enclosure. 40 ft perimeter

curve and 15 ft diameter. Three animals observed clinging to mesh wire. Rock shelter on the ground. Two wooden nesting boxes on top of rock shelter. Earth

substrate. No vegetation but branches inside. Barrier in front of cage. Signboard present.

RED PANDA: Rectangular enclosure, 50 ft x 30 ft. Well vegetated with bamboo inside. Sloping enclosure. Wooden box. One animal observed in a tree. No barriers.

RED PANDA: Extremely large enclosure. 150 ft x 50 ft. Large cement shelter provided. One animal observed walking on the ground. Huge trees, creepers and shrubs in this cage. Enclosure presents a very appealing look to the visitors and appears acceptable for these animals. Signboards present.

HIMALAYAN BLACK BEAR: Large open air enclosure. 140 ft x 45 ft x 9 ft. Rocky surface with vegetation. Dry moat inside enclosure. Five small holding facilities attached to this open air enclosure. These cages are 10 ft x 10 ft x 10 ft in dimension. Three animals were observed in these facilities. All of them exhibited extremely high levels of stereotypic behaviour. These animals were filmed through holes in the barrier netting. The cages are very dark with little sunlight filtering through the wire mesh outside. The holding facilities are accessible to the public. We were informed by Zoo staff that there are five Himalayan Black Bears in Darjeeling Zoo, two males and three females. No food or water was observed inside the holding cages. The open air enclosure is equipped with logs, but it is not known if the Zoo employs any other form of environmental enrichment to help mitigate engagement in stereotypic behaviours. The investigators observed four animals in two days, all of them showing very high levels of stereotypic behaviour. Head twisting was observed in an animal in the open air enclosure, along with pacing and circling in animals in the attached cages. One animal in a cage was observed banging its head against the cage roof. Bar sucking was also observed in the caged animals. Food and water were not observed, either in the open air enclosure or any of the cages. Signboard present.

LANGUR: 30 ft x 15 ft x 15 ft cage. Earth substrate. Branches and some grasses inside. Five animals observed, two females with young and one adult male. The male possessed a woolly coat quite distinct from the coat of langurs in plains. Small holding facility adjacent to Tibetan Wolf cage. Wild Himalayan Hoary Bellied Squirrel also observed in this cage. Signboard and barrier present.

TIBETAN WOLF: Open air enclosure. 20 ft x 25 ft. Earth substrate. 1 shrub and 1 log inside. Den attached. Three animals observed. This enclosure is adjacent to the Langur holding facility. During the feeding time of the Langurs, one wolf was observed to run toward the holding facility. There is possibly a stress factor involved here for the Langurs if the wolves constantly approach them when they are in their small cage. Barrier and signboard present.

TIBETAN WOLF: Open air naturalistic enclosure. 50 ft x 40 ft. Grassy floor with tall trees growing. Den attached. Four animals observed sleeping. Zoo staff informed there are twenty animals. A pair of these animals were originally brought from Himachal Pradesh. They were rescued animals from the wild. They have bred in Darjeeling Zoo.

SIBERIAN TIGER: Open air enclosure with vegetation. 85 ft x 100 ft x 20 ft. Den attached. One animal observed sitting on top of cement shelter. Barrier and signboard present. Siberian Tigers in Darjeeling Zoo are descended from a pair gifted to India by Nikita Khrushchev, the former Russian Premier. The Siberian Tigers at Darjeeling Zoo have been breeding since 1958 and recently two cubs were sent to Shimla Zoo in Himachal Pradesh.

TIBETAN WOLF: Open air enclosure. 35 ft x 35 ft x 8 ft. Attached to two dens. Few shrubs inside, growing on mud flooring of the enclosure. One large tree within the enclosure. Logs inside. Five animals observed, three adults and two juveniles. Juveniles observed resting in a hole in the ground. No signboard and barrier.

TIBETAN WOLF: Open air enclosure. 80 ft x 35 ft x 10 ft. Earth substrate with shrubs and trees growing inside. Rock shelter inside and burrows on the ground. Five animals observed. No signboard or barrier fencing. No food or water observed within the enclosure.

SIBERIAN TIGER: Open air enclosure, 110 ft x 85 ft x 20 ft. Sloping enclosure with vegetation. Rock shelter and den inside. Two animals observed inside dens. Barrier and signboard present. There are three Siberian Tigers in Darjeeling Zoo, one male and two females.

CLOUDED LEOPARD: 30 ft x 40 ft x 12 ft cage. Vegetation inside. Cage floor covered with rotten leaves. Top of the cage partially covered with polythene. Logs provided. Den attached. Cement water bowl

observed. One animal observed lying outside the den. It appeared as though the animal was locked out during Zoo visiting hours for public display. Being a secretive animal, Clouded leopards in captivity prefer to stay hidden for a good portion of each day in most Zoos. On both visits, the animal was observed lying in front of the den, so it's possible the animal was waiting for the first available opportunity to remove itself from the glare of Zoo visitors. Display of the animal in this case seems to take precedence over its welfare. Signboard and barrier present. Visitors observed yelling in front of this cage. This male animal was brought from Itanagar Zoo in Arunachal Pradesh. Zoo staff informed there are ongoing efforts to procure a mate.

COMMON LEOPARD: 35 ft x 40 ft x 12 ft cage. Shrubs, grass and other vegetation. Floor covered with dead leaves. Rock den. Holding facility attached. Water bowl present. Two animals observed, one stereotypically pacing. Zoo staff informed there are five of these animals in Darjeeling Zoo. Signboard and barrier present.

COMMON LEOPARD: 35 ft x 40 ft x 12 ft cage. Floor covered with dead leaves. A 14 ft x 14 ft shelter inside the cage. Water bowl present. Two animals observed, one stereotypically pacing, while another was resting on a log. Signboard and barrier present.

SNOW LEOPARD: 55 ft long tapering enclosure, 30 ft wide at the narrowest point and 40 ft wide at the widest point, 12 ft high. Very small shrubs inside the cage. Cage flooring covered with dead leaves. Rock shelter. Den attached. One animal observed pacing. Tail of this animal seems earthed due to constant rubbing on the floor. Signboard present. No barrier. Visitors observed shouting in front of cage.

SNOW LEOPARD: 40 ft x 40 ft x 12 ft cage. Rocky surface inside enclosure with plants and dead leaves. Rock shelter. One animal observed pacing, rolling on the ground and sharpening its claws. No barrier fencing. There are twenty Snow Leopards in Darjeeling Zoo, thirteen females, five males and two female cubs. Some of the animals are kept in a breeding facility some way off the main Zoo premises. This facility is accessible to the public on permission granted by the Zoo authorities. Snow leopards have been imported to Darjeeling Zoo from Helsinki Zoo, Finland and Zurich Zoo, Switzerland as well as Zoos in USA.

YAK: Enclosure, 65 ft x 55 ft. Sloping enclosure, forms part of the hills. Three adult animals observed. Food in the form of browse and water bowls were noted. Signboard present. No barrier.

HIMALAYAN TAHR: Enclosure, 55 ft x 55 ft. Earth substrate and a few trees inside. Rock shelter. Enclosure part of natural hilly slope on which the Zoo is situated. Two rocky climbing areas. Three animals observed, two adults (One male and one female) and one female bax. These animals were imported from Helsinki Zoo, Finland. The bax is one year old. No barrier fencing.

BHARAL OR BLUE SHEEP: Hilly open air enclosure, 60 ft x 55 ft. Shrubs and trees inside. Grassy substrate. One rocky climbing area offered. One animal observed. Conversations with Zoo staff reveal that this animal is a male brought from Bhutan. A pair was imported but the female has died since. Signboard present. No barrier in front of enclosure. People observed shouting and banging the wire of this enclosure. The investigators are not aware of any Bharal kept in any other Zoo in the world.

MARKHOR: Hilly open air enclosure, 50 ft x 55 ft. Shrubs inside. One rocky climbing facility. One small cement water reservoir inside. One male animal observed sitting on top of climbing area. A pair of Markhors was imported to Darjeeling Zoo from Helsinki Zoo, Finland. One animal is dead. Signboard present. No barrier. People shouting in front of cage.

GORAL: Hilly, sloping open air enclosure, 55 ft x 70 ft. Vegetation, mainly shrubs inside. Terraced flooring. Large hut shelter. Water bowl present. Stairs inside the cage. Tibetan Wolf cage opposite to this cage. There could be a stress factor involved for the Goral when the wolves howl. One male animal observed, brought from Gangtok Zoo, Sikkim. Signboard present, but no barrier in front.

BARKING DEER: Open air enclosure, 55 ft x 70 ft. Grassy enclosure with shrubs. Straw shelter inside. Two animals observed. Signboard present but no railing in front of cage.

SEROW: Hilly, open air enclosure, 40 ft x 70 ft. Terraced terrain. Dead leaves on floor. Rocks inside. Trees present inside enclosure. A wooden hut shelter with tin roof. One black animal observed. Animal observed feeding on browse offered by keepers. This animal is a wild caught female animal from Darjeeling forests. Signboard present but no barriers.

Birds

BHUTAN GREY PEACOCK PHEASANT: Glass (or fiberglass) fronted cage. 15 ft x 18 ft x 10 ft. The cage is well vegetated with ferns growing on the earth covering the cage floor. There is a wooden cottage-like shelter inside the enclosure. Two adult birds were observed. Food and water facilities were noticed. There are numerous branches in the cage and one bird was observed perching on them. The enclosure seems to provide adequate space for the birds to move around. There is another cage attached at the back of this cage to which the birds have access. It was about 15 ft x 12 ft x 10 ft in dimension and had vegetation inside. The cage has a railing in front. The glass front definitely serves the purpose of keeping out noise and the inevitable rubbish thrown inside by visitors.

KALIJ PHEASANT: Glass fronted cage. 15 ft x 18 ft x 10 ft. Earth substrate and vegetation inside, although less vegetation than in the previously described enclosure. Shelter inside. Food and water were observed. One female bird was observed with a chick. There is a cage attached to this cage. The attached cage is 15 ft x 12 ft x 10 ft in dimension and 2 males and 2 females and 1 chick were observed inside. Both the cages have branches and the birds can forage in the grass for food. The Zoo's environmental enrichment efforts have undoubtedly contributed to the a reasonably high level of welfare for these birds.

HIMALAYAN MONAL PHEASANT : Glass fronted cage. 18 ft x 15 ft x 10 ft. Vegetation and branches. Small cottage like shelter inside. One bird (male) observed eating food strewn on the cage floor. Water bowl present. There is a cage attached to this enclosure having Bhutan Grey Peacock Pheasants. 15 ft x 15 ft x 10 ft cage. It is a breeding facility. One adult Bhutan Grey Peacock Pheasant was observed inside with a chick. Signboard present in front of Himalayan Monal Pheasant cage.

GOLDEN PHEASANT: Glass fronted enclosure. 12.5 ft x 25 ft x 8 ft. Earth substrate. Sculpted mounds and logs provided. Food and water observed. Large wooden circular cottage-like shelter inside cage. Two males and two females observed. Has a cage attached at the rear end of public access. Signboard and railing present.

SILVER PHEASANT & RED JUNGLE FOWL: Glass fronted enclosure. 12.5 ft x 25 ft x 8 ft. Earth substrate. Earth mounds and logs provided. Food and water observed. Large wooden circular cottage-like shelter inside cage. One animal observed. Attached cage at the rear has Red Jungle Fowl. Signboard and railing present.

LADY AMHERST'S PHEASANT: Glass fronted enclosure. 12.5 ft x 25 ft x 8 ft. Earth substrate. Mounds, logs and branches provided. Food sprinkled on the ground. Water bowl provided. Large wooden circular cottage-like shelter inside cage. Vegetation, mainly shrubs inside. One male and one female bird observed. An attached cage at the rear end of this enclosure. Signboard and railing present.

JAPANESE GREEN PHEASANT: Enclosure signboard says 'Japanese Green Pheasant', but one of the investigators had observed the same bird labeled as Mongolian Green Pheasant at Jamshedpur Zoo in Jharkhand state. The two birds in Darjeeling seemed to be of the same species. Shelter inside. Vegetation inside cage. Enclosure attached at the rear having Reeves Pheasant. Food and water not observed. Signboard and railing in front of cage.

NATURE INTERPRETATION CENTRE: The Nature Interpretation Centre in Darjeeling Zoo offers an audio-visual presentation about Himalayan fauna and flora against the background of Singalila National Park which is situated close to the Zoo. Models of animals are used with lighting and audio effects, including calls of various animals and a running English commentary. A guide conducts visitors. The presentation was impressive, especially when one considers that very few Zoos offer any kind of worthwhile educational programming. In fact, this kind of audio-visual educational facility may be the only one of this kind in a Zoo in India. It is a commendable effort to make visitors aware of the Himalayan environment.

COMMENTARY

Darjeeling Zoo let the investigators with a positive impression. The facility seems to have specific goals and knows what it is trying to achieve. Their specialization on Himalayan fauna (with the exception of the Siberian tigers) is commendable.

Although valid questions can be raised about the validity of Darjeeling Zoo's captive breeding efforts, the facility

does seem to have potential as an educational facility. The investigators met the Zoo's Director, Scientific Officer and the Chief Animal Coordinator. A discussion took place with the Scientific Officer, Dr. Sunita Pradhan, on different issues facing the Zoo. Dr. Pradhan has been associated with the Zoo since 1992. Her Ph.D. work focused on Red Pandas in the wild, so she has considerable expertise in tracking them under difficult conditions. She expressed concern about the welfare of captive animals and mentioned the difficulty encountered when trying to obtain suitable companions for the single animals.

Dr. Pradhan accompanied the investigators to the Snow Leopard and Red Panda breeding facility. Two Snow leopard cubs were observed with their mother. She stressed that there is a general lack of awareness about animals and lamented about the widespread misbehaviour of Zoo visitors, something we observed. We were also given a tour of the Zoo laboratory.

Most of the enclosures in Darjeeling Zoo seem to provide a tolerable environment for the animals who appear to be physically healthy. Several animals are kept singly but the Zoo is apparently trying to rectify this problem.

RECOMMENDATIONS

1. An institution wide program of environmental enrichment should be developed and implemented. Special attention should be focused on enrichment of the various carnivore cages and enclosures.
2. Several cages (e.g., palm civet, slow loris, Himalayan black bear) are grossly substandard and need to be substantially expanded and refurbished or the animals moved to new, more suitable accommodation.
3. All animals should be provided with an ability to remove themselves from public view.
4. The Zoo should make every effort to provide all animals, especially those now kept singly (e.g., bharal, markhor, serow, goral) with appropriate social environments.
5. The proximity of predator and prey exhibits should be reviewed. The fact that predator and prey can easily see each other may be a source of chronic stress.
6. Exhibits that currently lack public stand-off barriers should have them installed as soon as possible.
7. Educational programs should be improved. Specific information about each species should be displayed. A video show on the snow leopard at the Nature Interpretation Center is also recommended.
8. The Zoo should consider phasing out the display of non-native Siberian Tigers once their existing tigers expire.
9. The Zoo should make every effort to participate in legitimate captive propagation initiatives with the aim of releasing endangered animals into wild environments. Apparently, the Zoo is currently trying to breed pheasants in collaboration with the World Pheasant Association for reintroduction purposes. Their Red Panda project has apparently resulted in the release of some animals to the wild.
10. The Zoo should seriously consider the utility and ethics of breeding snow leopards if it is not possible to reintroduce them to the wild.

GUINDY ZOO

Madras, Tamil Nadu—July 6 - 7, 2002

INTRODUCTION

Guindy Zoo is situated near the Indian Institute of Technology in Madras and is run by the Forest Department of Tamil Nadu. It is adjacent to the Madras Snake Park. Started as a children's Zoo, the facility was inaugurated by Jawaharlal Nehru, the former Prime Minister of India.

ANIMAL HOUSING AND HUSBANDRY

Mammals

- FREE-LIVING AXIS DEER:** There are free-living Axis Deer roaming just outside the Guindy Zoo gate. These deer seem tame and approach visitors, begging for food. They live in the nearby woods and were observed foraging amongst rubbish for food. Five animals were observed.
- AXIS DEER:** Open air enclosure, 200 ft x 100 ft. Sand substrate and trees growing. Thatched shelter inside. Water tank in shelter. 15 individuals observed.
- DHOLE:** Cage, 70 ft x 25 ft. sand substrate. Den attached. Water pool, 6 ft x 3 ft. Logs inside. Three animals observed sleeping. Signboard and barrier present.
- STRIPED HYENA:** Open air enclosure, 30 ft x 30 ft. Two shelters attached; one 10 ft x 30 ft and another 10 ft x 4 ft. Soil substrate in open air enclosure. One animal lying in a hole adjacent to a tree trunk. Two animals in the 10 ft x 4 ft shelter. Barrier and signboard present.
- INDIAN PORCUPINE:** Circular cage, 6 ft in diameter. Dry, hard soil substrate. Gram and carrots as food in tray. Water bowl inside. One animal observed hiding in cement shelter. No signboard and barrier.
- SAMBAR DEER:** Open air enclosure, 100 ft x 80 ft. Barren enclosure, no grass inside. Few trees with metal fencing. Mud wallow. Keeper observed placing food in troughs. No water container was noticed. 25 animals observed. No barrier and signboard.
- ASIAN ELEPHANT:** Circular enclosure, 350 ft in circumference. Soil substrate and banyan trees inside. Large shed inside. One young elephant chained by right fore leg to a post. The individual is without tusks. Browse provided. No water pool or trough. Pronounced stereotypies (e.g., constant swaying) observed. Video footage obtained.
- BLACKBUCK:** 35 ft x 55 ft enclosure. Sand substrate. Thatched shelter. Food and water provided in troughs. 20 animals observed. No signboard and barrier.
- JUNGLE CAT:** Circular cage, 10 ft in diameter, 3 ft high. Dry, hard mud substrate. No branches or any form of environmental enrichment. Water bowl observed. Cement shelter. One animal observed sleeping in a hole in the ground.
- STRIPED HYENA:** 15 ft x 8 ft cage. Entirely barren with a rock shelter. One animal inside shelter. Signboard and barrier absent.
- CHOWSINGA ANTELOPE AND AXIS DEER:** 20 ft x 20 ft enclosure. Cement shelter. Food observed but no water. Three animals observed. No signboard and barrier.
- RHESUS MACAQUE:** Circular cage, 15 ft in diameter and 25 ft high. Sand substrate. Tires, one log and a broken swing offered as environmental enrichment. Food and excreta observed mixed together. Three individuals observed. No water in cage. Animals taunted by visitors. No signboard present.

STRIPED HYENA: Cage, 20 ft x 15 ft x 20 ft. Cement floor. One cage attached; 18 ft x 15 ft. Rock shelter. One animal observed. No signboard but barrier present.

COMMON PALM CIVET: 3.5 ft x 3.5 ft x 3.5 ft cage. Cement floor. Shelter inside. Water bowl observed. One animal observed. Barrier present but no signboard.

JACKAL: Circular cage, 8 ft in diameter and 1.5 ft high. Cement floor and cement roof. No food or water observed. Very dim environment. Two animals observed, circling continuously. No signboard but barrier present.

NILGIRI LANGUR: Cage, 15 ft x 15 ft x 18 ft. Sand flooring. Attached shelter, 15 ft x 10 ft x 10 ft. Dead tree inside cage. No food or water observed inside cage. Three animals observed. Children noticed feeding animals. Signboard and barrier present.

INDIAN PORCUPINE: Circular cage, 12 ft in diameter. Soil substrate. Cement shelter. Food and water provided. Two animals observed inside shelter. Signboard present but no barrier.

COMMON LANGUR: Cage, 25 ft x 12 ft x 18 ft. Attached cage, 8 ft x 5 ft. sand substrate. Logs and branches inside cage. Food or water not observed. Three individuals observed. Signboard and barrier present.

LION-TAILED MACAQUE: 20 ft x 16 ft x 15 ft cage. Sand substrate. Logs and branches inside. One hanging tire provided as environmental enrichment. Food strewn around the cage floor; excessive numbers of flies. Two individuals observed. Barrier and signboard present.

COMMON OTTER: Pit, circular, 150 ft circumference. Cement flooring and rock mound inside. Water facility, 4 ft x 6 ft. Trees growing inside enclosure. Rock shelter. Dead and rotting fish inside pit. Two animals observed. No signboard and barrier observed.

JACKAL: Cage, 12 ft x 12 ft x 6 ft. sand substrate. No vegetation. Rock shelter. No food, but water observed inside cage. Two animals observed. No signboard but barrier present.

RHESUS MACAQUE: 12 ft x 12 ft x 6 ft cage. Barren cage, sand substrate. Cement feeding platform. Two dead log stumps. Food strewn around, but no water. Cage extremely dirty. Three animals observed. No signboard but barrier present.

BARKING DEER: 25 ft x 20 ft x 8 ft cage with metal fencing. Sand substrate. Attached den. One small plant in otherwise barren cage. Water bowl observed. Six animals in cage. Keeper observed inside cage. Signboard and barrier present.

BONNET MACAQUE: Circular cage, 100 ft in circumference, 15 ft high. Cement flooring. Tiny cement shelter. Cage extremely dirty and reeking of smell. Dry well inside cage. 75 animals inside; cage grossly overcrowded and animals observed showing aggression toward each other. Dirty pool inside cage. Enormous amount of visitor misbehaviour observed in front of this cage with visitors hitting, taunting and feeding the macaques. Signboard present.

BENGAL FOX: 25 ft x 10 ft cage. Sand substrate. Rock shelter. One log inside. No food or water observed. One animal observed sitting on top of rock shelter. Barrier present.

Birds

BENGAL VULTURE: Oval cage, 40 ft major axis, 12 ft high. Bougainvillea plants inside. Dead branches present. Water bowl observed. Leftover food observed and cage stinking. One bird observed. No barrier, but signboard present.

WHITE BELLIED SEA EAGLE & BLACK KITES: Cage, 50 ft x 20 ft x 12 ft. Trees and branches inside. Thatched roof. Dead fish and water inside. Three Black Kites and one White Bellied Sea Eagle. Signboard does not mention Black Kites. No barrier. People observed teasing birds.

AVIARY: 80 ft x 100 ft cage. Trees and pond inside. Species observed include Rosy Pelican, White Ibis, Grey Heron, Night Heron, Little Egret, Painted Stork, Lesser Flamingo, Muscovy Duck, Spoonbill, Demoiselle Crane and Cattle Egret. Separate signboard for each species. No barrier.

HORNED EAGLE OWL: Circular cage, 7 ft high and 12 ft in diameter. One bamboo log inside. No shelter. Two birds observed perched on log. People observed taunting birds. No signboard or barrier.

EMU: 20 ft x 20 ft cage. Sand substrate with red soil. Food and water bowl observed. Two young birds observed. One bird roaming the perimeter of the cage, other lying on the ground throwing its legs. The bird on the ground was observed as having a tumour on one leg. Veterinarian observed attending to the bird with tumour. Barrier present but no signboard.

INDIAN PEAFOWL: Cage, 20 ft x 18 ft x 30 ft. Red soil substrate. No shelter. Water in tiny bowl. Food strewn on the ground. One male individual observed. No signboard but barrier present.

INDIAN PEAFOWL: Cage, 18 ft x 30 ft x 30 ft. Sand substrate. Food strewn on the ground. Water bowl observed. Cement shelter inside. Three birds observed: two males and one female. No signboard but barrier present.

INDIAN PEAFOWL: Cage, 18 ft x 30 ft x 30 ft. Cement shelter. Food strewn on cage floor. Water bowl present. Four birds observed: three males and one female. No signboard but barrier present.

SARUS CRANE: 18 ft x 13 ft x 30 ft cage. Sand substrate. Food and water observed inside. One tree inside cage. One bird observed. No signboard but barrier present.

WHITE PEAFOWL: 14 ft x 18 ft x 30 ft cage. Sand substrate. Cement shelter. One tree inside. Food and water observed. One bird observed. No signboard but barrier present.

BLACK HEADED MUNIA, WHITE BELLIED MUNIA, SPOTTED MUNIA & COMMON QUAIL: Circular cage, 12 ft in diameter and 10 ft high. Sand floor. One log and nesting boxes provided. Branches inside. Around fifty Munia birds of three species and one Common Quail. No food or water observed. No signboard and barrier.

GUINEA FOWL: Circular cage, 8 ft in diameter. Sand substrate and large cement mound inside. Food tray and water can observed inside. Four birds observed. No barrier but signboard present.

MANILA GOOSE: Oval enclosure, 25 ft major axis. Soil substrate. Oval water pool, 12 ft major axis. Empty cages inside. No barrier.

ALEXANDRINE PARAKEET & ROSE-RINGED PARAKEET: Circular cage, 120 ft in circumference, 30 ft high. Soil substrate. 15 Rose-Ringed Parakeets and three Alexandrine Parakeets. No food or water present. Signboard present but no barrier.

SILKY FOWL: 4 ft x 5 ft cage. Cement floor. Two black birds observed. No food but water present. Signboard present.

SILKY FOWL: 4 ft x 3 ft cage. Cement floor with wood chip covering. One white individual observed. No food or water observed. Signboard present.

BARN OWL: Cage, 20 ft x 12 ft x 10 ft. Mats covering three sides of the cage to provide privacy to birds. Sand substrate. Two logs inside. One wooden shelter. Water present but no food observed. Three birds observed, one resting on a log and two inside shelter. Signboard and barrier present.

BUDGERIGARS & PEACH FACED LOVEBIRDS: 8 ft x 8 ft x 8 ft cage. Wooden chips as cage flooring. Twigs and nest boxes. Food and water observed. 20 budgerigars and two Lovebirds observed.

COCKATIEL: 8 ft x 8 ft x 8 ft cage. Wooden chips as cage flooring. Twigs and nest boxes. Food and water observed. Six birds observed.

Reptiles

STARRED TORTOISE: Circular cage, 6 ft in diameter. Cement substrate. Dirty water in a bowl. Keeper observed presenting carrots, tomatoes, cabbage and spinach. 150 animals observed, almost all juvenile. Animals observed crawling on top of each other. Enclosure overcrowded. No signboard or barrier.

COMMON INDIAN MONITOR: 4 ft x 3 ft cage. Cement floor. One dry branch inside. One plastic water bowl. No food in cage. Two Reptiles observed. Barrier and signboard present.

ESTUARINE CROCODILE: 20 ft x 20 ft cement pit. Wire mesh on top. 3 ft wall separating cage from adjacent crocodile cages. Water facility, 10 ft x 10 ft. Water

depth, 6 inches. Little sand inside pit. One 6.5 ft individual inside. Signboard present but no barrier.

ESTUARINE CROCODILE: 20 ft x 20 ft cement pit. Wire mesh on top. 3 ft wall separating cage from adjacent crocodile cages. Water facility, 10 ft x 5 ft. Water depth, 6 inches. Little sand inside pit. One 7 ft individual inside. Signboard present but no barrier.

ESTUARINE CROCODILE: 20 ft x 20 ft cement pit. Wire mesh on top. 3 ft wall separating cage from adjacent crocodile cages. Water facility, 10 ft x 10 ft. Water depth, 6 inches. Little sand inside pit. One 6.5 ft individual inside. Signboard present but no barrier.

ROCK PYTHON: Glass fronted cage, 3.5 ft x 5 ft x 3.5 ft. Sand substrate. Mud pot shelter. Small water pool. No snake observed. No barrier but signboard present.

BINOCELLATE COBRA: Glass fronted cage, 12 ft x 8 ft x 3.5 ft. Sand substrate. Rocks inside. Water facility. One snake observed. Signboard and barrier present.

MADRAS POND TURTLE: 5 ft x 5 ft cage, glass fronted. Sand substrate and water pool inside. No animals observed. Signboard and barrier present.

ROCK PYTHON: Glass fronted cage, 4.5 ft x 6 ft x 3.5 ft. Sand substrate. Water pool inside cage. One small branch. Rocks observed inside cage. One snake observed. Signboard and barrier present.

RAT SNAKE: Glass fronted cage, 4.5 ft x 6 ft x 3.5 ft. Sand substrate. Water pool inside cage. One small branch. Rocks observed inside cage. One snake observed. Sloughed skin observed also. Signboard and barrier present.

STARRED TORTOISE: Glass fronted cage, 4.5 ft x 5 ft x 4 ft. Sand substrate. Small pool. Food strewn around on feeding platform. One plant inside. Five animals observed, four adults and one juvenile. Two animals observed in water. Signboard and barrier present.

MARSH CROCODILE: Circular pit, 25 ft in diameter. Soil substrate. Trees inside. Circular pool, 20 ft in diameter. Water depth, 6 inches. A portion of pool was dry. Cement pot inside pool having a tree. One crocodile observed. No signboard and barrier present.

COMMENTARY

Guindy Zoo does not appear to have any objective other than as a place where visitors can obtain a few hours of entertainment watching animals. There is no visible attempt at legitimate conservation or education programming.

Supervision at this Zoo was minimal and visitor misbehaviour was rampant.

The animal housing conditions were abysmal and many animals displayed pronounced stereotypes.

RECOMMENDATIONS

Deficiencies at Guindy Zoo are serious and substantial. This Zoo should be closed down and the animals moved to more appropriate accommodation elsewhere.

Until closure, the following recommendations are made in an attempt to mitigate the most serious and immediate animal welfare problems.

1. The solitary Asian elephant should be moved to a socially appropriate environment in another facility with other elephants.
2. All carnivores should be moved to more appropriate accommodation elsewhere.
3. An institution wide program of environmental enrichment should be developed and implemented.
4. No new animals should be acquired and all breeding should be stopped.
5. The Forest Department should establish a committee comprised of a wide range of stakeholders to develop and implement a strategy for relocating the existing animal collection and closing the Zoo.

HYDERBRAD ZOO

Hyderabad, Andhra Pradesh—September 15-16, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- BLACK AND WHITE COLOBUS MONKEY:** Circular open air enclosure, diameter 60 ft. Earth substrate and grass. Mounds. Trees inside. Logs. Water moat surrounding enclosure, 10 ft in width. One attached den. Food on the ground. No water facility observed. One animal observed. Signboard and barrier present.
- ORANGUTAN:** Circular open air enclosure, 65 ft in diameter. Moat surrounding enclosure, 12 ft wide. Earth substrate. Grass, mounds and logs. Two neem trees. Attached den. No food or water observed in enclosure. One male orangutan observed. Flap-Shellled Turtles in the moat. Signboard and barrier present.
- CAPPED LANGUR:** Circular open air enclosure, 30 ft in diameter. Two islands, each 10 ft in diameter, joined by bamboo poles. Water moat surrounding islands. Two wooden shelters, each 3 ft x 3 ft x 3 ft. Two wooden boxes. No food or water observed in enclosure. Two animals observed. Fishes and turtles in the moat. Signboard and barrier present.
- CHIMPANZEE:** Circular open air enclosure, 250 ft in circumference. Dry earth substrate. Grass and small plants inside. Mounds. Trees. Water moat, 10 ft in width surrounding enclosure. No food or water observed in enclosure. Two animals observed. Signboard and barrier present.
- WOLF'S MONKEY :** Circular open air enclosure, 150 ft in circumference. Dry earth substrate. Grass and trees. Logs. One shelter, 3 ft x 4 ft x 3 ft. One animal observed pacing on a log. Signboard and barrier present.
- LION-TAILED MACAQUE :** 12 ft x 10 ft x 10 ft cage. Cement substrate. Dry water reservoir, 1 ft x 1 ft. One 6 ft x 3 ft x 3 ft cage inside. No food or water observed in enclosure. One animal observed inside the 6 ft x 3 ft x 3 ft cage. Signboard and barrier present.
- WOLF:** Circular open air enclosure, 450 ft in circumference. Dry earth substrate. Grass and trees. Dirty water moat surrounding enclosure, 8 ft wide. Attached den. Four animals observed. Signboard and barrier present.
- WHITE TIGER :** 35 ft x 45 ft cage with 18 ft high fencing. Sand substrate. Logs. One circular water pool, 8 ft in diameter. Very little water in pool. One attached rock den. One animal observed pacing. Signboard and barrier present.
- TIGER:** Open air enclosure, 650 ft perimeter. Earth substrate with bushes. 15 ft wide water moat surrounding enclosure. Trees. Rocks. Bamboo clumps. Keeper observed feeding one animal. No water facility in enclosure. Three animals observed. Signboard and barrier present.
- STRIPED HYENA:** Triangular open air enclosure with sides of 25 ft, 70 ft x 18 ft. 5 ft high wall surrounding enclosure. Earth substrate. Dry water pool, 6 ft x 10 ft. Trees. Rocks. No food observed. One animal observed. Signboard and barrier present.
- PUMA:** 25 ft x 70 ft x 18 ft cage. Earth substrate with grass and bushes. Trees. Dirty water pool, 7 ft x 9 ft. Attached rock den. Two animals observed. Signboard and barrier present.
- INDIAN RHINOCEROS:** 30 ft x 180 ft paddock. Earth substrate with grass. Trees. 12 ft x 18 ft pool with 3 ft deep water. No fodder observed in enclosure. One animal observed. Signboard and barrier present.

MALAYAN SUNBEAR: 55 ft x 110 ft open air enclosure. Earth substrate. Logs, stones and trees inside enclosure. 6 ft wide water moat in front of enclosure. One water pool, 6 ft x 9 ft. Stone shelter, 3 ft x 3 ft x 3 ft. No food observed inside. Two animals observed. One animal observed drinking water from the moat. Signboard and barrier present.

RATEL: Circular open air enclosure, 25 ft in diameter. Earth substrate with grass. Numerous holes in the ground. Trees inside. One cement water reservoir, 1 ft x 1 ft. Two plastic pots inside. One animal observed self mutilating for over fifteen minutes. No food observed. Signboard and barrier present.

ASIAN ELEPHANT: 200 ft x 600 ft paddock. Earth substrate with grass and stones. Trees and plants inside. Water pool, 12 ft x 15 ft. Straw observed on the ground. Eight animals observed. Signboard and barrier present.

SWAMP DEER: 330 ft x 80 ft paddock. Wet earth substrate. Trees. Water moat in front of enclosure, 5 ft wide. Attached shelter. Food and water troughs present. Ten animals observed. Signboard and barrier present.

SANGAI: 430 ft x 80 ft paddock. Earth substrate with grass. Plants and trees. Dry moat in front of land. No water reservoir observed in enclosure. Five animals observed. Signboard and barrier present.

ASIATIC WILD ASS: 180 ft x 125 ft paddock. Earth substrate with grass. Plants and trees. 6 ft wide moat in front of land, filled with chickweed. Fodder inside enclosure. No water trough observed. One animal observed with ears missing. Signboard and barrier present.

SAMBAR: 280 ft x 130 ft paddock. Earth and stone substrate. Grass and trees. 8 ft wide moat filled with chickweed. No water pool in enclosure. Six animals observed. Signboard and barrier present.

BLACKBUCK: 260 ft x 100 ft paddock. Earth substrate. Trees and plants. Dry water pool, 8 ft x 10 ft. 8 ft wide moat in front of land, filled with chickweed. Thirty animals observed. Signboard and barrier present.

SMALL INDIAN CIVET: 8 ft x 8 ft x 8 ft glass fronted cage with cement roof. Gravel substrate. Plastic pot. Logs. No food and water observed. One animal observed. Signboard present but no barrier.

INDIAN PORCUPINE: 16 ft x 8 ft x 8 ft cage. Gravel substrate. Logs. Water pot. No food observed. Three animals observed. Signboard present but no barrier.

FULVOUS FRUIT BAT: The nocturnal house provides these animals with free flight. There is a secluded area though, 40 ft x 8 ft x 8 ft which is basically to underpin the signboard and affix one particular place in line with the rest of the collection. The bats are free to fly throughout the nocturnal house. Gravel substrate. Cement branches. No food or water observed. Two porcupines occupy the basement of the area. Ten flying foxes observed. Fulvous Fruit Bats could not be identified.

COMMON OTTER: 50 ft x 30 ft open air enclosure with glass front. 6 ft high wall surrounding enclosure. Earth and stone substrate. Trees and rocks inside. Water reservoir in front of enclosure, 5 ft wide and 1.5 ft deep. Live fish observed in water. Two animals observed. Signboard and barrier present.

JUNGLE CAT: 6 ft x 6 ft x 6 ft cage. Cement roof. Gravel substrate. Plastic pot. No food or water observed. One animal observed. Signboard and barrier present.

Birds

MALABAR PIED HORNBILL: 10 ft x 15 ft x 15 ft cage. Earth substrate. Logs. Small plants. Water reservoir, 1 ft x 1 ft. Food in plastic pot. Two birds observed. Signboard and barrier present.

LADY AMHERST'S PHEASANT: 12 ft x 20 ft x 8 ft cage. Hard earth substrate. Logs and plants inside. Bamboo shelter. No food or water observed. Plastic packet inside. Two birds observed. Signboard and barrier present.

AVIARY: 40 ft x 80 ft x 20 ft cage. Earth substrate. Trees and logs. Three pools, 8 ft x 30 ft, 8 ft x 15 ft and 10 ft x 15 ft. Plastic food pots. Birds observed include 15 Painted Storks, one white Necked Stork, two Spoonbills, four purple Moorhens, five Lesser Whistling Teal, one Black Necked Stork, two Sarus Cranes and five Ruddy Shelducks. Signboards and barrier present.

RUFIOUS-NECKED HORNBILL: 25 ft x 30 ft x 20 ft cage. Dry earth substrate. Trees, bushes and logs inside. Water pool, 6 ft x 8 ft. One bird observed. Signboard and barrier present.

GREAT PIED HORNBILL: 50 ft x 30 ft x 20 ft cage. Dry earth substrate. Trees, bushes and logs. Wooden shelter. Water pool, 6 ft x 10 ft. Keeper observed feeding birds and delivering a very informative talk. Two birds observed: one male and one female. Signboard and barrier present.

AVIARY: 90 ft x 30 ft x 35 ft cage. Earth substrate. Trees. Cement platform. Elliptical water reservoir, 15 ft major axis. One island within water reservoir. No food observed. Birds observed include two Egyptian Vultures, one King Vulture and one Tawny Eagle. Signboards and barrier present.

KALEEJ PHEASANT AND BUDGERIGAR: 8 ft x 8 ft x 8 ft cage. Sand substrate. Mud pots for water and food. Eleven nesting pots. Asbestos shelter. Logs. Four Kaleej Pheasants and 14 Budgerigars observed. Signboard and barrier present. Signboard says Ring-Necked Pheasant.

MOTTLED WOOD OWL: 6 ft x 6 ft x 6 ft glass fronted cage with cement roof. Gravel substrate. Logs and nesting box. No food or water observed. Three birds observed. Signboard and barrier present.

CHATTERING LORY: 12 ft x 12 ft x 12 ft cage. Gravel substrate. Asbestos sheet on wire roof. Logs and plants. Mud water pot. Food trough. Nesting box. One bird observed. Signboard and barrier present.

MILITARY MACAW: 20 ft x 14 ft x 12 ft cage. Roof partly covered with asbestos. Back of the cage cemented. Earth substrate. Plants and logs. One metal swing and one hanging metal ring. One wooden nesting box. Empty food and water bowls. One bird observed. Signboard and barrier present.

SULPHUR CRESTED COCKATOO: 15 ft x 12 ft x 10 ft cage. Roof partly covered with asbestos. Back of the cage cemented. Earth substrate. Plants and logs. One metal swing and one hanging metal ring. One wooden nesting box. Empty food and water bowls. One cage inside measuring 1 ft x 1 ft x 1.5 ft. One bird observed in this cage. Signboard and barrier present.

Reptiles

GALAPAGOS GIANT TORTOISE: 30 ft x 80 ft paddock. 3 ft high surrounding fence. Dry earth substrate. Trees. One dry pool, 10 ft x 15 ft. Food inside. One Axis Deer observed eating food meant for the tortoises. Two tor-

toises observed. Signboard and barrier present. One signboard stated that the tortoises don't need water.

SALTWATER CROCODILE: Elliptical open air enclosure, major axis 35 ft. 4 ft high wall with 3 ft high fencing on it. Earth substrate. Trees. Two water pools, one elliptical with major axis of 8 ft and another triangular with sides of 6 ft, 7 ft and 6 ft. Very little water in pools. No food in enclosure. Two Reptiles observed. Signboard and barrier present.

WATER MONITOR LIZARD: Elliptical open air enclosure, major axis 30 ft. Earth substrate and mounds. Trees. Circular water pool, 6 ft in diameter and with 4 inches deep water. One animal observed. Signboard present but no barrier.

RETICULATED PYTHON: Semi-circular glass fronted cage with 25 ft circumference. 10 ft high. Wire roof. Earth substrate and grass. One circular plastic water pot, 1 ft in diameter. One snake observed. Signboard and barrier present.

COMMENTARY

Hyderabad Zoo seems to be a well maintained Zoo. It is extremely large and has a varied collection of animals. Some of the enclosures are extremely large and as good as any in the world. This Zoo was rated as one of the best in the world by former Bronx Zoo director William Conway.

Despite this, stereotypic behaviours can be observed in some animals, including carnivores and a Wolf's monkey. Some water facilities, including moats, were filled with dirty water.

Visitor behaviour was relatively poor with the majority of visitors seeming insouciant and uncaring about any education or conservation message. Despite this, the educational efforts of the Zoo are commendable. Hyderabad was the only Zoo inspected that provided keeper talks for visitors.

Size: Generally adequate for. The hornbill cages are the largest bird cages observed by the investigators during their inspections. However, some bird cages, especially those housing pheasants seemed small and overcrowded. They also looked quite makeshift.

Substrate: Almost exclusively earth.

Furnishings/Enrichment: Basic. There is poor utilization of vertical space in the ape cages.

Educational Graphics: Adequate. Slightly more information than signboards at many other Zoos.

Safety: Generally adequate, but Zoo visitors were still observed disturbing animals with relative impunity. Hyderabad Zoo is internationally infamous for the killing of 'Sakhi,' a tiger who was killed in its enclosure. That incident highlighted a problematic security situation, but it is not known if security has been improved since that time.

CONCLUSIONS

Hyderabad Zoo is the second largest Zoo visited by the investigators and appears to be quite well maintained. There are safari-type facilities that could not be visited during the inspection. However, Sloth bears in the safari area were visible and were observed stereotyping (e.g., pacing, swaying).

Educational programs include signboards and keeper talks, but both could be improved and made more interactive. The Zoo is apparently also a research station for the Centre For Cellular And Molecular Biology. Whether or not the research has any practical benefit for animals is unknown.

There does not seem to be any involvement in organized rehabilitation and/or reIntroduction programs.

RECOMMENDATIONS

1. An institution wide program of environmental enrichment should be developed and implemented.
2. All animals should be provided with appropriate social environments (e.g., Wolf's monkey).
3. The Saltwater crocodile pit should be expanded and refurbished.
4. Emphasis should be focused on in-situ conservation programs rather than ex-situ research.
5. Signboards should be improved and additional educational programs developed.
6. Security should be evaluated on a periodic basis and improved.

KATRAJ RESCUE CENTRE AND RAJIV GANDHI ZOO

Poona, Maharashtra—November 12, 2002

INTRODUCTION

Katraj Rescue Centre and Rajiv Gandhi Zoo work in tandem and are situated in the same location so they are both dealt with in one report. The Zoo is supposed to house all the animals from the Peshwe Park Zoo in Poona. The rescue centre is divided into two distinct sections: a rescue centre and a snake park.

Rescue Centre

The rescue centre is not open to the public. The investigators were given a tour of the facility by its coordinator Mr. Shriram Shinde, a former journalist for The Times Of India. The centre houses approximately 500 individual animals. Overall maintenance of the facility seemed quite good.

According to Mr. Neelam Kumar Khaire, the center's Director, about 80% of the animals are eventually released back into the wild. This is an excellent turnover rate but the investigators were not able to verify that figure.

There were a small number of problematic issues identified during the tour. A pair of Peafowl were being kept as breeders; the centre hopes to release their offspring. This does not seem necessary, especially when the peafowl may be candidates for release.

The center also houses leopards on a permanent basis. Although the release of carnivores to the wild is difficult, even the best of circumstances, release options for these animals should be investigated before summarily resigning them to a lifetime of captivity.

There is also a single Cinereous Vulture. Apparently, no effort has been made to release this bird. Options for the release of this bird should also be explored.

Overall, the rescue center seems to be doing a excellent job.

SNAKE PARK

ANIMAL HOUSING AND HUSBANDRY

Reptiles

RAT SNAKE: 16 ft x 16 ft pit with 6 ft high wall. Asbestos roof. Soil substrate. Logs. 3 ft x 4 ft water pool. Six snakes observed. Signboard present, but no barrier.

STARRED TORTOISE: 12 ft x 12 ft open air enclosure. Soil substrate. Two palm trees. Cement platform on the ground. Rocks. Cement hut, 2 ft x 3 ft x 2.5 ft. Fruit observed inside. Eighteen tortoises observed. Signboard present, but no barrier.

MARSH CROCODILE: Irregular shaped enclosure with 50 ft perimeter. Soil substrate. Stones, trees and other vegetation inside. Oval water pool, 9 ft major axis. One reptile observed. Signboard present, but no barrier.

BENGAL MONITOR LIZARD: 14 ft x 14 ft pit with 5 ft high wall. Soil substrate. Logs and vegetation. Light bulb inside. Six animals observed. Signboard present, but no barrier.

GHARIAL: 16 ft x 7 ft pit. Gravel substrate. Vegetation. 7 ft x 5 ft pool. Light bulb inside. Three animals observed. Signboard present, but no barrier.

COMMON KRAIT: 2.5 ft x 1 ft x 1.5 ft cage with glass front. Stone chip substrate. Plants and small logs. Light tube affixed on wire roof. Circular glass water pot, 3 inches in diameter. One snake observed. Signboard and barrier present.

SAW-SCALED VIPER: 2.5 ft x 1 ft x 1.5 ft cage with glass front. Stone chips as substrate. Plants and small logs. Light tube affixed on wire roof. Circular glass water pot, 3 inches in diameter. One snake observed. Signboard and barrier present.

COMMON SAND BOA: 3.5 ft x 2 ft x 2.5 ft cage with glass front. Stone chip substrate. Plants and small logs. Light tube affixed on wire roof. Plastic water pot. Four snakes observed. Signboard and barrier present.

ROCK PYTHON: 3.5 ft x 2 ft x 2.5 ft cage with glass front. Carpet substrate. Plants and small logs. Light tube affixed on wire roof. Circular glass water pot, 3 inches in diameter. Four snakes observed. Signboard and barrier present.

ROCK PYTHON: 7 ft x 2 ft x 2.5 ft cage with glass front. Stone chip substrate. Plants and small logs. Light tube affixed on wire roof. Plastic water pot, 3 inches in diameter. Four snakes observed. Signboard and barrier present.

COMMON WOLF SNAKE: 2.5 ft x 1 ft x 1.5 ft cage with glass front. Stone chip substrate. Artificial plant and log. Light tube affixed on wire roof. Circular glass water pot, 3 inches in diameter. One snake observed. Signboard and barrier present.

PITVIPER: 2.5 ft x 1 ft x 1.5 ft cage with glass front. Stone chip substrate. Large stone. Light tube affixed on wire roof. Glass water pot. One snake observed. Signboard and barrier present.

SOFT-SHELL TURTLE: Irregular shaped enclosure, 40 ft in perimeter. Soil substrate. Bamboo clumps and other vegetation inside. Log. Triangular water pool with sides of 7 ft, 8 ft and 8 ft. Shelter inside, 2 ft x 2 ft x 2 ft. Eight animals observed. Signboard present, but no barrier.

ROCK PYTHON: 14 ft x 14 ft x 8 ft cage. Wired roof with asbestos covering. Soil substrate. Stones and logs. 6 ft x 7 ft water pool having very little water. Two plants. Four snakes observed. Signboard present, but no barrier.

MARSH CROCODILE: 14 ft x 14 ft pit with asbestos roof. Gravel substrate. Water pool covering significant area of the enclosure. Stones and a log. One reptile observed. Signboard explains the presence of murky (dirty?) water claiming it is good for algae growth which is beneficial to the crocodiles. No barrier.

SLIDER TERRAPIN: 3 ft x 1 ft x 1 ft glass enclosure with wire roof. Gravel substrate. 2 inches of water and dry basking area. Four slider terrapins and a Trionyx gangeticus turtle. No signboard, but barrier present.

SLIDER TERRAPIN: 2 ft x 1 ft x 8 inch glass enclosure with wire roof. Gravel substrate. 3 inches of water with basking area. Two specimens. No signboard but barrier present.

MIXED SPECIES ENCLOSURE: 12 ft x 12 ft pit with gravel substrate. Logs. 3 ft x 4 ft water pool. Species of snake kept include Indian cobra, Vine snake, Rat snake, Red Sand boa, Trinket snake, Checkered Keelback Water snake, Green Keelback snake and Russell's Viper. Signboard present, but no barrier.

CHECKERED KEELBACK WATER SNAKE: 15 ft x 7 ft pit. Stone substrate with dry leaves. 6 ft x 4 ft water pool. Logs. Lamp inside. Thirty snakes observed. Signboard present, but no barrier.

COMMENTARY, CONCLUSIONS AND RECOMMENDATIONS

Unlike the rescue centre, the snake park seems rather dilapidated. The majority of the enclosures are quite small, dirty and generally unsuitable for the species they confine. The facility appears to play no significant conservation role and provides only a marginal educational experience to visitors.

The reptile exhibition struck the investigators as completely unnecessary. The snake park should consider phasing out its permanent display animals and exhibition component and instead should focus on expanding its role as a reptile rehabilitation and release facility.

Since almost all of the enclosures need improvement, downsizing the collection may allow more focus and resources to be devoted to fewer "rescued" animals allowing for high welfare standards. Such a move may also reduce the overall costs of running the facility.

RAJIV GANDHI ZOO

ANIMAL HOUSING AND HUSBANDRY

INDIAN PORCUPINE: Oval shaped, open air enclosure; major axis 40 ft. Soil substrate. Cement pipes on the ground. Fine netting inside to provide shade. Carrot, beet and bananas observed as food. No water observed. Four animals observed. Signboard and barrier present.

SLOTH BEAR: 90 ft x 40 ft open air enclosure. Hardpan substrate. Bushes and trees. Dry moat surrounding enclosure, 6 ft wide. Front wall of moat approximately 12 ft high. Two attached shelters. No food or water observed. Two animals observed. Signboard and barrier present.

AXIS DEER: Circular paddock, 60 ft in diameter. Hardpan substrate. Grass and trees. Shelter provided. Food and water trough noticed. Eight animals observed. Signboard and barrier present.

SAMBAR: 250 ft x 60 ft paddock. Hard, dry soil substrate. Grass and trees. Shelter provided. Food and water trough noticed. Seven animals observed. Signboard and barrier present.

BLACKBUCK: Circular paddock, 90 ft in diameter. Hard, dry soil substrate. Grass and trees. Shelter provided. Food and water trough noticed. Fourteen animals observed. Signboard and barrier present.

BONNET MACAQUE: Oval open air enclosure, major axis 60 ft. Soil substrate. Thickly vegetated. Dry moat surrounding enclosure, 6 ft wide. Front wall of moat about 10 ft high. Attached shelter. Three animals observed. Signboard and barrier present.

RHESUS MACAQUE: Oval open air enclosure, major axis 50 ft. Soil substrate. Thickly vegetated. Moat surrounding enclosure, 6 ft wide. Front wall of moat about 10 ft high. Attached shelter. Five animals observed. Signboard and barrier present.

COMMENTARY, CONCLUSIONS AND RECOMMENDATIONS

Rajiv Gandhi Zoo seems very well designed and constructed and covers a substantial area. All enclosures are spacious and seem adequate to satisfy the biological and behavioural requirements of the animals.

There is little need to house common species of animals like Rhesus and Bonnet Macaques. That space could be used to house rescued animals. This facility could serve as a model rehabilitation centre in India.

MADRAS CROCODILE BANK

Madras, Tamil Nadu—July 9, 2002

INTRODUCTION

Madras Crocodile Bank is situated close to Madras, the capital of Tamil Nadu. It was started in 1976 as a captive breeding centre to support India's dwindling crocodile populations.

Initially, Madras Crocodile Bank concentrated only on the three species of crocodilians found in India: the Marsh crocodile, Saltwater crocodile and the Gharial. However, it presently houses exotic, non-native crocodile species, as well as a number of chelonians and snakes.

Madras Crocodile Bank has always claimed an important role in crocodilian conservation, education and research of crocodilians.

Ownership: Private. Operated by a board of trustees. Started by Romulus Whitaker, an American domiciled in India.

ANIMAL HOUSING AND HUSBANDRY

Reptiles

RED-CROWNED ROOF TURTLE & THREE

STRIPED ROOF TURTLE: Glass fronted water tank with two cemented sides approximately 7 ft x 3 ft x 1 ft. Pebble flooring. Large rock inside and moss growing on glass and rock. Air bubble pipe present. Tank water reasonably clean. Two turtles observed inside tank. A number of small fish along with two larger fish, all of unidentified species. Adjoining basking area with grass growing, 7 ft x 3 ft x 1 ft. Barrier in front of exhibit.

SMALL-ROOFED TURTLES: Glass fronted tank with two sides, 7 ft x 3 ft x 1 ft. Tank water clean. Pebble flooring and logs. Moss growing inside tank. No air bubble pipe observed. Two small turtles observed. A

number of small fish along and two larger fish, all unidentified species. Adjoining basking area with grass, 7 ft x 3 ft x 1 ft. Barrier in front of tank.

RETICULATED PYTHON: Glass fronted exhibit with three cement sides measuring approximately 8 ft x 10 ft x 8 ft. Tank water clean. Soil substrate, logs and sand areas. Rocks, plants and several branches inside. Two platforms and a water pool about 3 ft in diameter. Wire roof. Two snakes observed, both lying coiled. Barrier present in front of cage.

INDIAN FLAP SHELL TURTLE: Glass fronted tank with two cemented sides approximately 8 ft x 3 ft x 2 ft. Tank water reasonably clean. Attached to a basking area, 8 ft x 2 ft x 2 ft with grass growing. Sandy flooring in the tank with logs. A number of large and small fish observed, all unidentified species. One turtle observed. Signboard and barrier present.

CROWNED RIVER TURTLE: Glass fronted cage with two cemented sides measuring about 8 ft x 3 ft x 2 ft. Sandy bed in tank with logs. A large number of fish observed inside tank. Tank water clean. Adjoining basking area measures about 8 ft x 2 ft x 2 ft with grass. One turtle observed. Signboard and barrier in front of cage.

RIVER TERRAPIN: Glass fronted tank with two cemented sides about 8 ft x 3 ft x 2 ft. Pebble flooring in tank. Tank water a bit murky. Large fish in tank, unidentified species. Attached basking area with grass. Two River Terrapins observed. Signboard and barrier present.

FLAP SHELL TURTLE: Glass fronted tank with two solid sides measuring approximately 8 ft x 3 ft x 2 ft. Sandy flooring in tank and logs observed. Tank water clean. Adjoining basking area, 8 ft x 3 ft x 2 ft. No filtration system observed. Many fish inside water tank. A very large Flapshell Turtle specimen observed. Signboard and barrier present.

INDIAN BLACK TURTLE: Glass fronted water tank measuring about 8 ft x 3 ft x 2 ft. Pebbles, rocks and logs inside tank. Attached basking area, 8 ft x 2 ft x 2 ft. Many fish in tank. No filtration system noticed. Eight turtles observed. Signboard and barrier present.

GHARIAL: 100 ft x 50 ft x 3 ft enclosure. 100 ft x 50 ft pond. Two islands serve as dry resting areas in the pond, both with living trees. They measure approximately 40 ft x 15 ft and 12 ft x 8 ft. Two animals observed. Signboard present, but no barrier.

AMERICAN ALLIGATOR: 40 ft x 40 ft x 4 ft enclosure. Pond measures 25 ft x 10 ft. Trees and shrubs growing on dry area. Two animals observed. Signboard present, but no barrier.

FALSE GHARIAL: Open air enclosure with 50 ft x 40 ft dry area and 25 ft x 12 ft pond. Trees and other vegetation growing on dry area. 2 ft high walls surrounds enclosure. Three Reptiles observed. Signboard present, but no barrier in front of cage.

SALTWATER CROCODILE: Open air enclosure, with 2 ft high cement walls surrounding. 20 ft x 20 ft dry area. Water pool present. Trees, vegetation and rocks in enclosure. Two Reptiles observed. Signboard present but no barrier. Wire fencing on top of walls, presumably placed there as a security barrier.

MORELET'S CROCODILE: 60 ft x 30 ft x 4 ft open air enclosure. One large 40 ft diameter water pool. Two small water facilities. Dry area has a sand substrate. Three animals observed. Signboard indicates enclosure has one male and nine female crocodiles. No barrier.

WEST AFRICAN DWARF CROCODILE: 40 ft x 25 ft x 3 ft enclosure. 15 ft x 8 ft pool. Extensive vegetation inside cage with palm trees, shrubs and grasses. No animals observed. Signboard present, but no barrier in front of cage.

MARSH CROCODILE: 100 ft x 60 ft x 5 ft enclosure with 30 ft x 20 ft pool. Island in pool, sandy dry area, green trees and rocks in exhibit. Enclosure filled with large number of crocodiles, too many to count. Signboard indicates that there are 520 animals in this pit. Obvious signs of overcrowding observed, such as animals jostling for space both on land and in the water. Many animals observed lying on top of each other. Feeding sessions are conducted for the public; a

bucket of beef strips costing twenty Indian rupees per bucket. The investigator paid the keeper for such a show for filming purposes. No barrier in front of cage.

GHARIAL: 150 ft x 100 ft x 3 ft enclosure. Sandy land area. Large water pool and trees growing inside cage. 50 ft x 15 ft pool. Five animals observed. Signboard indicates there are 3 males and 11 females. No barrier.

SALTWATER CROCODILE: Pit-type exhibit measuring approximately 60 ft x 50 ft x 5 ft. Sandy land area. Iron fencing on top of walls as safety measure. Circular 25 ft diameter pool. Seven animals observed. A total of 46 are housed in this enclosure according to the signboard

SALTWATER CROCODILE (NAMED JAWS III): 75 ft x 60 ft x 5 ft enclosure with 20 ft diameter pool. Green trees and grass inside. Dry area with sand substrate. Enclosure divided in two sections by chain link fencing. One section houses a large female Saltwater crocodile intended to mate with Jaws III. Jaws III was not observed.

MARSH CROCODILE: 100 ft x 70 ft x 5 ft sandy, pit-style enclosure with 10 ft x 25 ft pond filled with murky water. Green trees growing inside pit area. Approximately 100 Reptiles observed. This exhibit seemed overcrowded with animals vying for land and water space. No barriers, but signboard in front of cage.

SLENDER SNOURED CROCODILE: Off-exhibit enclosure, partially visible from outside. No animals observed.

SLENDER SNOURED CROCODILE: 15 ft x 10 ft pit-style enclosure. Two small water pools, logs, trees and rocks noted in exhibit. Three Reptiles observed. Signboard indicates there are 4 females and 3 males. Wire fencing on top of walls. No barrier.

WATER MONITOR LIZARD: 25 ft diameter exhibit with sandy substrate. Green vegetation, logs, branches and rock shelters present in exhibit, as well as a water pool. One mature tree inside with metal plates on trunk to prevent lizards from climbing. One animal observed. Signboard indicates there are 18 animals present. No barrier in front.

GREEN IGUANA: Circular cage, 15 ft in diameter. Grassy substrate. Water pool, 2 ft x 15 ft. Logs, and rocks inside pit. A large tree with a metal plate to prevent animals from escaping. Two Reptiles observed. No barrier.

MARSH CROCODILE: 200 ft x 100 ft x 3 ft sandy pit. Large water pool inside. Trees growing inside pit. Approximately 100 animals present. No signboard or barrier.

SIAMESE CROCODILE: Circular pit, 25 ft in diameter and 3 ft high. Sandy substrate, rocks and trees. Water pool, 3 ft x 20 ft. Wire fencing on top of walls. Eight individuals observed. No barrier.

NILE CROCODILE: Pit, 40 ft x 15 ft x 3 ft. Sandy substrate. Trees and rocks inside. Water pool, 25 ft x 5 ft. Wire fencing above walls. Three Reptiles observed.

MARSH CROCODILE: Sandy pit, 100 ft x 100 ft x 5 ft. 100 ft long water pool, 3 ft wide. Few trees. Iron fencing above walls. Enclosure severely overcrowded. Signboard indicates there are 561 crocodiles in this pit. This enclosure is the most overcrowded animal cage observed by the investigators during this project.

KING COBRA: Glass fronted cage with tiles and thatched roof. Sandy floor, logs, rocks, mud pots and piles of dried leaves inside exhibit. Two light bulbs observed inside enclosure. Glass fronted cage leads to another cage approximately 12 ft x 6 ft x 6 ft in size. This second cage was equipped with dry branches, a soil substrate and a 1 ft x 1 ft water pool. Two King Cobras observed. Signboard indicates King cobras have bred at Madras Crocodile Bank and there are 32 snakes in this exhibit. Bamboo barrier in front of cage.

SPECTACLED CAIMAN: Circular pit, 20 ft in diameter with 3 ft high brick wall. Sandy substrate. Circular water pool, 5 ft in diameter. Green trees growing in exhibit. 2.5 ft high log fencing on top of brick walls. Seven Reptiles observed.

SPECTACLED CAIMAN: Pit, 30 ft x 12 ft x 3 ft. Sandy substrate, rocks and trees inside. 6 ft x 3 ft water pool. Two Spectacled caimans observed.

COMMENTARY

Madras Crocodile Bank is only a few acres in size and seems well laid out and maintained. Most of the enclosures appear adequate enough to satisfy the biological requirements of the animals they contain. Rare species such as the Batagur baska are being held and conditions are passable. The majority of the turtles are exhibited in appropriate tanks with adequate dry rest areas.

Madras Crocodile Bank is focused a great deal on captive breeding. Signboards provide visitors with information about captive breeding efforts and the reIntroduction of crocodiles to the wild.

Madras is one of the only Zoos to have bred King cobras successfully in captivity. In addition, they have successfully bred most of their crocodilians. Madras has 14 crocodilian species, including all three Indian species and a number of African and American species. Several turtle species and water monitor lizards have also been bred.

Madras does provide some educational programming for visitors. There is a well written guidebook entitled *Croc Talk*, written by Zahida Whitaker, wife of Madras Crocodile Bank founder Romulus Whitaker, which provides basic information about Reptiles. Madras also conducts snake venom extraction shows, but they were not being run during our inspection.

There are facilities for herpetological research. Residential quarters for visiting students were observed.

Madras has also produced films on gharials and King cobras and runs a conservation centre in the Andamans for herpetological research. It also publishes *Hamadryad*, a journal on herpetological research.

Despite success with captive breeding and research, there are problems at Madras Crocodile Bank. Several of the enclosures are grossly overcrowded and there is little evidence that the facility is taking proactive steps to deal with the overpopulation problem. Reportedly, the founder of Madras is a supporter of 'sustainable use' of Reptiles and is interested in crocodile farming for meat and leather in India. This kind of animal utilization should be abandoned since it is destructive in the long run to the species involved, along with there being serious welfare implications.

Independent expert sources have also expressed concern that many of the crocodiles in Madras Crocodile Bank are severely underfed. The overpopulation of certain species of crocodiles at the facility should be addressed immediately. As well, the disposal of Marsh crocodiles to grossly substandard Zoos such as Calcutta Snake Park is concerning.

RECOMMENDATIONS

1. All breeding of indigenous Indian crocodile species should be stopped immediately. Madras is already overcrowded.
2. The existing surplus population of crocodiles should be moved to more appropriate accommodation elsewhere. Euthanasia should be considered as a last resort solution to the overpopulation problem, if there are no other options available for dealing with surplus animals. Euthanasia should not be employed as a control method of convenience.
3. A review panel consisting of lay people, animal welfare workers, conservation biologists and Madras Crocodile Bank staff should be formed to examine workable, long-term, humane solutions to the serious problem of crocodile overpopulation at the facility.

MADRAS SNAKE PARK

Madras, Tamil Nadu—July 6 - 7, 2002

INTRODUCTION

The Madras Snake Park is a privately operated facility that was established in 1972 at Guindy in Madras. It has been granted recognition by the Central Zoo Authority of India. According to the guidebook, it attracts seven lakhs of visitors a year. It also conducts an outreach program to convey information about snakes to the general public and it publishes a quarterly newsletter entitled Cobra.

ANIMAL HOUSING AND HUSBANDRY

Reptiles

GREEN IGUANA: Pit type enclosure, 12 ft x 15 ft x 3 ft. Mud and sand substrate. Two water facilities. One circular, 7 ft in diameter. Another, 6 ft x 2 ft. Bamboo shelter supported by logs. Palm trees inside cage. Two wooden platforms. One dry plastic plate inside cage. One animal observed inside bamboo shelter. Barrier and signboard present.

MARSH CROCODILE: Semi circular cage, 20 ft perimeter curve. Five juvenile individuals, each about 1.5 ft in length. Circular water facility, 6 ft in diameter. Depth of water facility, about 5 inches. Two glass planks on the lower portion on the wall. No signboard or barrier. All Reptiles observed in water pool.

RETICULATED PYTHON: Cage, 15 ft x 10 ft. Wood chip substrate. Two rocks inside. Two logs. Small water pool. One large snake observed. Barrier and signboard present.

ROCK PYTHON: 15 ft x 10 ft cage. Hard mud substrate. Rocks and one log inside. One small pool without water. Light bulbs inside, protected by wire netting. Two individuals observed, one in a pool. Signboard and barrier present.

TRINKET SNAKE: Glass fronted cage, 2.5 ft x 2.5 ft x 2.5 ft. Hard mud litter surface. Bricks inside. Earthen water bowl. Keeper observed cleaning the cage. One snake observed twined on twigs. Light bulb inside. Barrier and signboard present.

TRINKET SNAKE: 2.5 ft x 2.5 ft x 2.5 ft cage, glass fronted. Hard pulverised mud substrate. Bricks. Earthen water bowl. Twigs and branches. One small plant inside. Light bulb in cage. One snake observed. Signboard and barrier present.

BRONZEBACK TREE SNAKE: 2.5 ft x 2.5 ft x 2.5 ft cage, glass fronted. Small plant inside. Finely ground earth substrate. Twigs. Light bulb inside. One snake observed. Signboard and barrier present.

COMMON SAND BOA: Glass fronted cage, 2.5 ft x 2.5 ft x 2.5 ft. Finely ground earth substrate. Water bowl. No branches. Small rocks. Light bulb inside. One snake observed. Signboard and barrier present.

RED SAND BOA: Glass fronted cage, 2.5 ft x 2.5 ft x 2.5 ft. Finely ground earth substrate. One glass platform, 2.5 ft x 2.5 ft, located about 8 inches high from the cage floor. Water bowl. One snake observed. Light bulb in cage. Signboard and barrier present.

VINE SNAKE: 2.5 ft x 2.5 ft x 2.5 ft cage, glass fronted. Potted plant and branches inside. Water bowl and rocks. Fine earth substrate. Light bulb in cage. One snake observed. Barrier and signboard present.

TRINKET SNAKE: Glass fronted cage, 2.5 ft x 2.5 ft x 2.5 ft. Branch inside. Hard, dry earth substrate. Water bowl present. One snake observed in plastic water bowl. Light bulb present. Signboard and barrier present.

COMMON WOLF SNAKE: Glass fronted cage, 2.5 ft x 2.5 ft x 2.5 ft. Water bowl inside. Finely ground earth substrate. Light bulb inside. Branch inside. Two snakes observed. Signboard and barrier present.

COMMON WOLF SNAKE: 2.5 ft x 2.5 ft x 2.5 ft cage, glass fronted. No light bulb inside. No branches. No rocks. Water bowl. Two snakes lying inside water bowl. Signboard and barrier present.

RAT SNAKE: Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Sand substrate and shallow water bowl. Earthen pot and bricks inside. Branches. One snake observed. Signboard and barrier present. No food observed in the shape of live or dead rats.

STRIPED KEELBACK SNAKE: Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Sand substrate and shallow water bowl. Earthen pot and bricks inside. Branches. One snake observed. Signboard and barrier present.

CHECKERED KEELBACK SNAKE: Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Sand substrate and shallow water bowl. Earthen pot and bricks inside. Branches. One snake observed. Signboard and barrier present.

OLIVE KEELBACK SNAKE: Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Sand substrate and shallow water bowl. Bricks inside. Branches. One snake observed. Signboard and barrier present.

ROCK AGAMA (*Psamnophilus blanfordanus*): Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Rocks and branch inside. Earthen pot and water bowl inside. One lizard observed. Signboard and barrier present.

INDIAN MONITOR: Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Small pebbles as substrate. Water tray and branch. No animals observed. Signboard and barrier present.

ROCK GECKO: Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Sand substrate. Rocks and log with stripped bark. Water bowl. One lizard observed. Signboard and barrier present.

INDIAN CHAMELEON: Glass fronted cage, 3.5 ft x 8 ft x 2.5 ft. Sand substrate. Water bowl. Rocks and potted plant. No animals observed. Signboard and barrier present.

EDUCATIONAL ENCLOSURE: Circular pit, 90 ft in circumference. Cement flooring. Rock mound inside. Potted plants and pebbles partially covering the floor.

4.5 ft high wall. 2.5 ft wire fencing on top of wall. One glass box on top of the rock mound for display of snakes. One water pool inside. Demonstrations at 11 am, 1pm, 3pm and 5pm. The 11 am show was video-taped. Stands surrounding enclosure.

WATER MONITOR: Pit, 20 ft x 12 ft x 3 ft. Mud substrate. Branches and one small plant inside. One small rock shelter. One water facility, 3 ft x 2 ft, around 3 inches deep. One lizard observed. Signboard present but no barrier. No food observed.

WATER MONITOR: Pit-type enclosure, 15 ft x 20 ft x 3 ft. Red earth substrate. Water pool, 8 ft x 2 ft, 6 inches deep. Drain surrounding three sides of the enclosure. Trees and plants inside cage. Trees with tin plates to prevent animals from escaping. Rocks but no shelter. Two lizards observed, each 4.5 ft long. Animals observed hiding beside a tree.

WATER MONITOR: Pit-type cage, 20 ft x 15 ft x 3.5 ft. Water pond, 8 ft x 2 ft. Rocks and earth mound inside enclosure. Dry drain on two sides of enclosure. Logs and one thatched umbrella-like shelter. Two lizards observed inside hole in mound. Signboard present but no barrier. No food observed.

YELLOW MONITOR: Pit, 10 ft x 15 ft x 3.5 ft. Earth substrate and scanty grasses. Water facility, 3 ft x 2 ft, roughly 2 inches deep. Two animals observed inside pot shelter. Signboard present but no barrier.

INDIAN MONITOR: Pit, 25 ft x 10 ft x 3.5 ft. Earth substrate and small plants. Water pond, 5 ft x 2 ft, 3 inches deep. Rock and shelter provided. Two animals in water pond. Signboard present but no barrier.

RAT SNAKE: Circular cage, 50 ft in diameter and 4 ft high. Glass fronted cage. Pebbles on cage floor. Three water bowls. No branches. No barrier but signboard present. No snake observed.

STARRED TORTOISE: Pit, 8 ft x 12 ft x 3 ft. Earth substrate and potted palms. Water bowl. Bamboo hut shelter. One raised brick platform on the 8 ft wall side. All adults inside bamboo hut. 2 ft x 2 ft cage inside housing three juvenile individuals. Eight adult individuals observed. Signboard present but no barrier. No food observed in the form of browse.

MADRAS POND TURTLE: Pit, 8 ft x 15 ft x 3 ft. Hard, dry earth substrate. Pond, 6 ft x 4 ft, divided into two parts, one part bereft of water. Water depth in pond approximately 4 inches. Bamboo shelter. Seven individuals observed. No food observed. Signboard present but no barrier.

INDIAN FLAPSHELL TURTLE: Pit, 8 ft x 12 ft x 2 ft. Empty, dry water facility, circular in shape and 3.5 ft in diameter. Cement flooring in cage and cement shelter. Two potted plants and one fern inside enclosure. Five animals observed inside cage. Signboard present but no barrier.

RETICULATED PYTHON: Cage with wire front and wire roof, 20 ft x 15 ft x 6 ft. Cement substrate. Water pond, 7 ft x 2 ft. Dirty, murky water in pond. Cement shelter, 5 ft x 2 ft x 2 ft. Logs, branches and rocks. Two snakes observed. Signboard and barrier present.

CHECKERED KEELBACK: Aquarium, 3.5 ft x 1.5 ft. 6 inch deep water. Two rocks, one partially submerged in water. Two corals. Pebble chips as aquarium flooring. Dysfunctional air bubble (filtration) facility. One snake in water. Signboard and barrier present.

YELLOW SEA SNAKE: Aquarium, 3.5 ft x 1.5 ft. Pebble flooring. 7 inch deep water. Four brain sponges in aquarium. Two air bubble pipes. One snake around 3.5 ft long. Individual was observed immobile. Signboard and barrier present.

INDIAN FLAPSHELL TURTLE: Aquarium, 3.5 ft x 1.5 ft. Asbestos surface, blue in colour. No plants. One rock. Water, approximately 6 inches deep. One air bubble facility. One individual observed. Signboard and barrier present. No food observed.

RED-EARED SLIDER: Aquarium, 3.5 ft x 1.5 ft. Water, 6 inches deep. Two rocks. Pebble flooring in aquarium. One air bubble facility. One adult individual observed. No food observed.

MADRAS POND TURTLE: Aquarium, 3.5 ft x 1.5 ft. Water depth, 6 inches. Pebble flooring. One rock and one earthen hiding place. One air bubble pipe. One Tilapia fish in aquarium. Three young Madras Pond Turtles observed. Signboard and barrier present.

MORELET'S CROCODILE: Semi circular cage, 50 ft circumference. Water facility, triangular, equilateral with 12 ft sides. 6 inch deep water. Sand substrate in cage. Cement basking area within pool. Wooden logs. Two large plants inside. Walls 2 ft high. One individual observed in water. Signboard and barrier present.

SPECTACLED CAIMAN: Triangular pit, 25 ft equilateral-ly, 5 ft high. Circular water facility, 6 ft in diameter, with 10 inch deep water. Pebble flooring in cage. Keeper observed cleaning cage with bleaching powder. Crocodile observed blinking during cleaning process, possibly to avoid eye irritation caused by the chemical. Signboard present but no barrier.

WEST AFRICAN DWARF CROCODILE: Circular cage, 15 ft in diameter, 3 ft high. Pebbles form floor of cage. Elliptical water facility, 6 ft as major axis. Water about 6 inches deep. One individual observed in water. Plastic rubbish observed in water blocking animal's snout. No food observed. Signboard present. Barrier absent.

SIAMESE CROCODILE: Pit, oval in shape, 45 ft major axis, 5 ft high. Earth substrate. Water facility, 8 ft x 4 ft. Depth of water, about 6 inches. Two Reptiles observed. Barrier and cage signboard present.

ESTUARINE CROCODILE: Pit type enclosure, 50 ft x 20 ft x 5 ft. Dry, hard earth substrate. Trees inside. Water pool, circular in shape, 6 ft in diameter. One adult crocodile observed. Signboard present, no barrier.

MARSH CROCODILE: Pit, 50 ft x 25 ft x 5 ft. Earth substrate. Trees growing inside cage. Circular water facility, 12 ft in diameter, and 6 inches deep. Sixteen animals observed. Signboard present but no barrier.

GHARIAL: 60 ft long enclosure with 4 ft high walls. Enclosure divided into two sections, one section circular, 12 ft in diameter. This circular enclosure has a round pond, 5 ft in diameter with water about 6 inches deep. One 12 ft individual observed in this enclosure, lying in the pond, obviously not fitting in. The second section of this enclosure is 30 ft x 30 ft with a 6 ft x 12 ft water pond. The water in this pond is about 6 inches deep. Both the sections have earth substrate with trees growing. There are five animals in the second section. Signboard present but no barrier. No food observed.

MARSH CROCODILE: Circular enclosure, 25 ft in diameter. Earth substrate and trees growing inside cage. Three water pools, 6 ft x 2 ft, 6 ft x 12 ft and 6 ft x 6 ft. 4 ft high walls with 2 ft high fencing on top. Bamboo clumps inside cage. Three individuals observed, two of them in the 6 ft x 2 ft pool. No signboard but barrier present.

ROCK PYTHON: 6 ft x 4 ft x 3 ft cage. Pebble flooring, with wood chips strewn. One log. No water facility observed. One individual observed. No barrier but signboard present.

ROCK PYTHON: 6 ft x 4 ft x 3 ft cage. Pebble flooring, with wood chips strewn. One log. No water facility observed. One individual observed. No barrier but signboard present.

ALDABRA TORTOISE: 30 ft x 20 ft enclosure. 3 ft high walls with 3 ft high fencing on top of walls. Water pool and shed made of branches. One individual observed eating spinach under shed. The investigator states that this is only the second captive facility in India where he has observed Aldabra Giant Tortoises, the other one being Kolkata Zoo in West Bengal. Barrier and signboard present. Keeper observed cleaning enclosure.

SPECTACLED COBRA: Glass fronted cage, 3 ft x 5 ft x 5 ft. Sand substrate. The glass pane is sloping towards the front from bottom to top. Water bowl and rock shelter. One snake observed inside shelter. Signboard states snake is fed on Tuesday and Friday. Barrier present.

INDIAN COBRA: Glass fronted cage, 3 ft x 5 ft x 5 ft. Sand substrate. Three rocks inside. The glass pane is sloping towards the front from bottom to top. Water bowl present and termite mound as shelter. One snake observed. Signboard states snake is fed on Tuesday and Friday. Barrier present.

BLACK COBRA: Glass fronted cage, 3 ft x 5 ft x 5 ft. Sand substrate. One rock inside. The glass pane is sloping towards the front from bottom to top. Water bowl present and termite mound as shelter. One snake observed. Signboard states snake is fed on Tuesday and Friday. Barrier present.

COMMON KRAIT: Glass fronted cage, 3 ft x 5 ft x 5 ft. Sand substrate. One rock inside. The glass pane is sloping towards the front from bottom to top. Water bowl present and earthen pot as shelter. One snake observed. Signboard states snake is fed on Friday. Barrier present.

SAW SCALED VIPER: Glass fronted cage, 3 ft x 5 ft x 5 ft. Sand substrate. One rock inside. The glass pane is sloping towards the front from bottom to top. Thorny twigs inside. Water bowl present and earthen pot as shelter. One snake observed. Signboard states snake is fed on Friday. Barrier present.

COMMON KRAIT: Glass fronted cage, 3 ft x 5 ft x 5 ft. Sand substrate. Two rocks inside. The glass pane is sloping towards the front from bottom to top. Water bowl present and earthen pot as shelter. Barrier present.

ROCK PYTHON: Pit type cage with wire roof, 20 ft x 10 ft x 7 ft. Hard, dry earth substrate. One log. Water pool, 8 ft x 2 ft. Rocks inside cage. No shelter. Two snakes observed, one inside water pool. No barrier. Signboard present.

COMMENTARY

Madras Snake Park seems to be a focused facility with reasonably good animal housing and husbandry and a commendable effort at public education. The leaflet hand-outs were of good quality and the educational presentation was informative.

The facility appears well maintained with the majority of the enclosures being better than the reptile enclosures found in most of the other Zoos inspected during this project. However, there does seem to be an overpopulation of Marsh crocodiles, possibly surplus from the Madras Crocodile Bank.

RECOMMENDATIONS

1. There should be no breeding of Marsh crocodiles as they are already in a surplus situation at Madras.
2. Attempts should be made to find mates for single individuals, especially the West African Dwarf Crocodile.
3. The Yellow Sea Snake appeared listless and debilitated. If the snake can be rehabilitated to a healthy state, consideration should be given to its release. If release is not an option, its accommodation should be improved. When the snake expires, it should not be replaced.
4. The Indian Flapshell Turtle enclosure did not have any water. All enclosures with aquatic or semi-aquatic Reptiles should be equipped with enough water to facilitate normal aquatic movements and behaviours.
5. Educational programming should be improved and more information about the animals on display made available to visitors.
6. The Zoo should consider downsizing its live animal collection allowing more resources to be devoted to fewer animals, possibly indigenous endangered species that could be assisted through captive propagation initiatives.



This pool is far too small for even one hippo (Bannerghatta).



Inadequate old concrete enclosures are common in India's zoos (Bannerghatta).



Small, barren enclosures provide few opportunities for natural behaviour (Bannerghatta).



Lack of activity can lead to obesity in many zoo animals (Bannerghatta).



Low fence around elephant compound makes pen potentially dangerous to visitors (Bannerghatta).



Elephant chaining can be extremely frustrating for these wide-ranging animals (Bannerghatta).



Rudimentary, poorly designed aquarium display (Bannerghatta).



Bear enclosure interior hard and poorly equipped (Bannerghatta).



Barren, raised concrete bear cages should not be used anymore (Mumbai).



Stray dogs are a problem in many Indian zoos (Mumbai).



Visitors gather to watch crows steal meat from hyenas (Mumbai).



Crows harass hyenas and steal good portion of their food; a symptom of poor animal management (Mumbai).



Hard packed earth is not a suitable floor surface for most animals (Mumbai).



Barren paddocks provide little stimulation to grazing animals (Mumbai).



Small, concrete cages with no privacy are not adequate (Mumbai).



Ungulate pens in many zoos are devoid of all vegetation; a sign of overcrowding (Mumbai).



Elephants may also be chained during daylight hours; inappropriate for a wide-ranging species (Mumbai).



Barren, concrete row cages fail completely to satisfy animal needs (Calcutta).



Inadequate cell-like cages are still common (Calcutta).



Overweight, bored lion on inappropriate floor (Calcutta).



Flat, barren rhino paddock (Calcutta).



Snake lies exposed on tile floor; an outdated and inappropriate form of reptile housing (Calcutta).



Gharial exhibit is simplistic and boring (Calcutta).



Monitors are active, wide-ranging lizards that require very large spaces (Calcutta).



Buffer zones around cages are lush and green, while interiors are desert-like; a possible sign of overcrowding (Calcutta).



Sloth bear pacing on barrier wall. Pacing is often a sign of psychological distress (Calcutta).



Zebras in barren exhibit (Calcutta).



Antiquated giraffe house and barren exhibit offers little stimulation to animals (Calcutta).



Stagnant pool and undersized enclosure for hippos. (Calcutta).



Tiny, barren jaguar cage is completely inadequate (Calcutta).



Elephant leans over poorly designed and unsafe barrier (Calcutta).



No vegetation in enclosure is often a sign of overcrowding (Delhi).



Chimpanzee sits in naturalistic island enclosure (Delhi).



Vegetation and equipment provide chimps with activity (Delhi).



Small Indian civet cage could be improved by better use of vertical space (Delhi).



Rhino paddock does not simulate animal's natural habitat (Delhi).



Flat surface and lack of features makes rhino paddock unstimulating (Delhi).



Small hippo pools seem to be ubiquitous in Indian zoos (Delhi).



Lion enclosure is far more natural and stimulating for the animals (Delhi).



Bear enclosure is large but boring because of concrete floor surface (Delhi).



Poor quality aquarium display (Hyderabad).



A single baboon, a highly social animal, was being kept in this enclosure (Hyderabad).



Larger, more natural monkey exhibit allows animals to express natural behaviours (Hyderabad).



Elephant in relatively large paddock (Hyderabad).



Elephants and other wide-ranging animals need very large spaces (Hyderabad).



Large lion paddock allows animals to express some natural behaviours (Hyderabad).



Lion lies in shade on forest floor (Hyderabad).



Rhino pen is barren; a common problem in India's zoos (Hyderabad).



Indian rhino walks on hard compacted earth (Hyderabad).



Small hippo pool in barren exhibit (Hyderabad).



Sloth bear perches on potentially dangerous barrier (Hyderabad).



Crocodiles crowd into undersized pool (Hyderabad).



Reptile exhibits are often small and simplistic (Hyderabad).



Monitor lizard tries to get through scratched, murky glass barrier (Hyderabad).

MAHENDRA CHOUDHURY ZOOLOGICAL PARK

Chandigarh, Haryana—December 26, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- CAPPED LANGUR:** Circular cage, 18 ft in diameter and 12 ft high. Soil substrate. Logs. Rock construction inside. Dry reservoir, 1 ft x 1.5 ft. No food or water observed. One animal observed. Signboard and barrier present.
- LION-TAILED MACAQUE:** Circular open air enclosure, 40 ft in diameter. Dry moat surrounding enclosure, 6 ft wide. Soil substrate. Grasses, logs and stones inside enclosure. Attached den. No food and water observed in enclosure. Two animals observed, one seemed to have a deformed spine. Signboard and barrier present.
- RHESUS MACAQUE:** Circular cage, 18 ft in diameter and 12 ft high. Soil substrate. Logs. Rock construction inside. Dry water reservoir, 1 ft x 1.5 ft. Attached den. No food or water observed. Two animals observed. Signboard and barrier present.
- TIGER:** Elliptical open air enclosure, major axis 120 ft. Dry moat surrounding enclosure, 6 ft wide. 15 ft high wall in front of moat. Soil substrate. Grasses, trees and logs. Two pools, 6 ft x 8 ft and 7 ft x 20 ft. One pool was dry. Attached den. No food observed. 11 animals observed. Signboard and barrier present.
- HIPPOPOTAMUS:** 40 ft x 60 ft paddock. 10 ft x 50 ft water pool. Soil substrate. Trees. Attached den. No food observed. Two animals observed. Signboard and barrier present.
- INDIAN RHINOCEROS:** 60 ft x 80 ft paddock. 8 ft wide water moat in front of land. Soil substrate. Trees. Water pool, 25 ft x 7 ft. Two attached dens, 6 ft x 7 ft. No food observed. One animal observed. Signboard and barrier present. Visitors disturbing animal.
- ASIAN ELEPHANT:** 100 ft x 120 ft paddock. Dry moat surrounding land area, 7 ft wide. Soil substrate. Grasses and two trees. Two logs. Water pool, 20 ft x 25 ft. Four attached shelters, each one 15 ft x 20 ft x 12 ft. No food observed in enclosure. Five animals observed. Signboard and barrier present.
- STRIPED HYENA:** Open air pit type enclosure, 50 ft x 30 ft with 6 ft high wall. Soil substrate. Trees. Dry pool, 6 ft x 4 ft. Attached den, 2 ft x 1.5 ft. No food or water observed. One animal observed. Signboard and barrier present.
- LEOPARD:** 30 ft x 60 ft x 20 ft cage. Soil substrate. One tree. Logs. Circular pool, dry, 8 ft in diameter. Cement platform situated 7 ft from the ground, 10 ft x 20 ft. Attached den. No food or water observed. One animal observed. Signboard and barrier present.
- ASIATIC LION:** Elliptical cage, major axis 45 ft and 20 ft high. Dry soil substrate. Two logs. Circular pool, dry, 7 ft in diameter. Cement platform situated 8 ft above ground level, 25 ft x 10 ft. No food or water observed. Seven animals observed. Signboard and barrier present.
- SLOTH BEAR:** Circular open air pit type enclosure, 30 ft in diameter. 8 ft high wall surrounding land. Soil substrate. Grasses. Logs. Attached den. No food or water observed. One animal observed swaying. Signboard and barrier present.
- HIMALAYAN BLACK BEAR:** Circular open air pit-type enclosure, 30 ft in diameter. 8 ft high wall surrounding land. Soil substrate. Grasses. Logs. Attached den. One wooden shed, 4 ft x 5 ft. No food or water observed. Two animals observed swaying. Signboard and barrier present.
- PORCUPINE:** 25 ft x 20 ft pit. Cement substrate. Cement shelter. No food or water observed. Two animals observed. Signboard and barrier present.

BLACKBUCK: Elliptical paddock, 40 ft x 100 ft. Soil substrate. Trees. Dry pool, circular, 3 ft in diameter. Attached shelter. Nine animals observed. Signboard and barrier present.

SAMBAR: Elliptical paddock, major axis 100 ft. Soil substrate. Grass and trees. Two pools, 3 ft x 8 ft and 10 ft x 15 ft. One pool dry. Attached cage with cement substrate, 20 ft x 30 ft. Food on the floor of the cage. 13 animals observed. Signboard and barrier present.

BURCHELL'S ZEBRA: Elliptical paddock, major axis 100 ft. Soil substrate. Grass and trees. Dry pool, 15 ft x 6 ft. One circular water reservoir, 3 ft in diameter having 6 inches of water. Attached den. Food observed inside. One animal observed. Signboard and barrier present.

SWAMP DEER: Elliptical paddock, major axis 90 ft. Soil substrate. Grasses and trees. Elliptical water pool, major axis 35 ft. Attached den. One animal observed. Signboard and barrier present.

AFRICAN CAPE BUFFALO: 35 ft x 85 ft paddock. Soil substrate. Trees. Water pool, 10 ft x 20 ft. Attached shelter, 12 ft x 8 ft x 8 ft. Food observed inside. One animal observed. Signboard and barrier present.

MITHUN: Oval paddock, major axis 110 ft. Soil substrate. Grasses and trees. Water pool, 7 ft x 18 ft. Attached cement shelter, 25 ft x 12 ft x 10 ft. Three animals observed. Signboard and barrier present.

OTTER: Triangular pit, having sides of 15 ft, 15 ft and 15 ft. Dirty water pond. No food observed in enclosure. One animal swimming in circles. Signboard present but no barrier.

Birds

SARUS CRANE: Circular cage, 18 ft in diameter and 20 ft high. Soil substrate. Dry pool, 5 ft x 12 ft. Cement platform, 4 ft x 8 ft platform. Cement food trough, 2 ft x 3 ft. Attached shelter. One bird observed.

SULPHUR CRESTED COCKATOO: 20 ft x 35 ft x 10 ft cage. Nylon netting over wire roof. Soil substrate. Logs. Water reservoir, 1 ft x 1.5 ft. Metal food pot, circular, 1 ft in diameter. No food observed. Two birds observed. Signboard and barrier present. Signboard says Silver Crested Cockatoo.

SPOTBILL DUCK: Circular cage 18 ft in diameter. 20 ft high. Soil substrate. Dry pool, 5 ft x 12 ft. Cement platform, 5 ft x 12 ft. Cement food trough, 2 ft x 3 ft. Attached shelter. One bird observed. Signboard and barrier present.

CORMORANT: Circular cage 18 ft in diameter. 20 ft high. Soil substrate. Dry pool, 5 ft x 12 ft. Cement platform, 5 ft x 12 ft. Cement food trough, 2 ft x 3 ft. Attached shelter. One bird observed. Signboard and barrier present.

Reptiles

MARSH CROCODILE: Elliptical open air enclosure, major axis 35 ft. Elliptical water pool having major axis 25 ft. Land area having grasses and plants. One reptile observed in water. Signboard and barrier present.

ROCK PYTHON: 20 ft x 10 ft x 8 ft cage. Soil substrate. Logs. One water reservoir, 1 ft x 1 ft. One glass box, 2.5 ft x 2.5 ft x 2.5 ft, having straw and a light bulb inside. Two Japanese quails inside this cage. No snake observed but quails possibly food for the snake which was out of sight. Signboard and barrier present.

COMMENTARY

Chandigarh Zoo is situated over a large area of land. It seems generally well maintained and the layout of the Zoo seems well planned. The existence of cages in some cases seems unnecessary since the Zoo has enough space to provide large, open air enclosures for all large. There is a quite spacious lion safari that perhaps could be utilised to house some of the carnivores presently confined in cages.

A number of animals are kept singly, even though they are social or would benefit from companionship with other members of their species.

Educational efforts are very ordinary. There is no planned conservation effort and the large numbers of carnivores show that the Zoo is possibly more interested in having sure fire crowd-pulling animals, rather than less popular animals that could be rehabilitated or offered lifetime retirement if they were rescued.

Size: Adequate in the case of the open air enclosures, but cages are generally undersized.

Substrate: Natural earth substrate in open air enclosures. Cement substrates predominate in cages, although some also have earth substrates.

Furnishings/Enrichment: Primitive or absent.

Educational Graphics: Very ordinary.

Safety: Adequate.

CONCLUSIONS

Chandigarh Zoo has an opportunity to become a very good education, conservation and rescue facility. They would have to stop breeding of all animals and phase out some of the existing large, replacing them with rescued circus animals and species that are in need of legitimate captive propagation efforts. Educational programming needs to be improved.

RECOMMENDATIONS

1. A no breeding policy should be adopted and strict acquisition policies developed.
2. The primate and bear cages should be expanded and improved.
3. An institution wide environmental enrichment program should be developed and implemented.
4. Animals kept singly (e.g., ungulates) should be provided with more appropriate social environments.
5. Signboards should be improved and other educational programming developed.

NEW DELHI ZOOLOGICAL PARK

New Delhi—December 21-23, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- WHITE TIGER:** Open air enclosure, 100 ft x 70 ft. 15 ft wide water moat in front of land. 15 ft high wall in front of moat. 15 ft high fencing on three sides. Earth substrate. Grass and trees. Attached den with sacks and exhaust fans. No food or water observed in enclosure. One animal observed pacing. It had protruding hip bones. Signboard and barrier present.
- HOOLOCK GIBBON:** 10 ft x 15 ft x 18 ft cage. Roof of cage partially covered x plastic and thatch. Cage with cement walls on three sides, each side measuring 10 ft x 10 ft. Substrate part cement and part hardpan. Log with tire attached. Metal rod. Hanging tire, sack and rope. Cement shelter on the ground, 6 ft x 6 ft x 3 ft. Straw on roof of shelter. Water bowl on the floor. No food observed in cage. One animal observed. Signboard and barrier present.
- RHESUS MACAQUE:** 13 ft x 15 ft x 18 ft cage. Plastic covering on roof. Substrate part cement and part hardpan. Cement walls on three sides of the cage, each side measuring 10 ft x 10 ft. Cement shelter on ground, 8 ft x 6 ft x 4 ft. No food or water observed in cage. One animal observed circling. Signboard and barrier present.
- COMMON LANGUR:** 13 ft x 15 ft x 18 ft cage. Plastic covering on roof. Substrate part cement and part hardpan. Cement walls on three sides of the cage, each side measuring 10 ft x 10 ft. Cement shelter on ground, 8 ft x 6 ft x 4 ft. No food or water observed in cage. One animal observed circling. Signboard and barrier present.
- LEOPARD:** 50 ft x 25 ft x 18 ft cage. Creepers growing on wire. Earth substrate. Dead grass. Elevated platform measuring 6 ft x 12 ft. Plants. Empty cement bowls. No food or water observed in cage. Two animals observed, one on cement perch. Signboard and barrier present.
- AXIS DEER:** 155 ft x 105 ft paddock. Earth substrate. Grass. No water observed in enclosure. Five specimens observed. Signboard and barrier present.
- ASIATIC LION:** 125 ft x 80 ft open air enclosure. Earth substrate. Dry moat in front of enclosure, 20 ft wide. 15 ft high wall in front of moat. Attached den, 20 ft x 25 ft x 15 ft. 8 ft x 8 ft x 8 ft cage connecting enclosure to den. This cage has cement substrate and a wooden platform on the ground. It has a thatched roof. No food or water observed in enclosure. Two animals observed, one male and one female. One female observed inside 8 ft x 8 ft x 8 ft cage. Signboard and barrier present.
- JACKAL:** 25 ft x 15 ft x 12 ft cage. Cement substrate. Fine netting on roof. Cage extremely smelly. No food or water observed in cage. Four animals observed, all pacing and circling. Signboard and barrier present.
- STRIPED HYENA:** 25 ft x 40 ft x 12 ft cage. Cement and earth substrate. Grass and logs. Attached den, 14 ft x 8 ft x 8 ft. No food or water observed in cage. One animal observed sleeping. Signboard and barrier present.
- SLOTH BEAR:** 120 ft x 85 ft open air enclosure. 20 ft wide moat with 14 ft high wall in front of moat. Wall at the back of the enclosure, 14 ft high. Earth substrate. Rocks. Trees. No food or water observed in enclosure. Two animals observed. Signboard and barrier present.
- AFRICAN ELEPHANT & ASIAN ELEPHANT:** 60 ft x 140 ft paddock. 7 ft wide moat in front of land area. Earth substrate. Rock mounds. Dirty water pool, 25 ft x 30 ft. One shed. Three shelters, each measuring 10 ft x 12 ft x 14 ft. No fodder noticed. Two Asian elephants (one male tusker and one female) and one young African elephant observed, all chained. All observed swaying. Signboards and barrier present.

WHITE TIGER: 15 ft x 15 ft x 7 ft cage. Thatched roof. Back of the cage cemented. White sand substrate. One log. One wooden platform on the ground. No food or water observed. Four animals observed. No signboard but barrier present.

GORAL: Semicircular paddock, 135 ft in diameter. Dry earth substrate. Trees. Two rock shelters, one measuring 8 ft x 5 ft x 5 ft and the other 4 ft x 5 ft x 5 ft. One food trough. No water. Three animals observed. Signboard present but no barrier.

GIRAFFE: 120 ft x 70 ft paddock. Dry moat surrounding enclosure, 5 ft wide. Earth substrate. Trees and logs. One cement shelter, 25 ft x 15 ft x 20 ft. Hanging metal food tray. No water observed. Two animals observed. Signboard and barrier present.

CHIMPANZEE: Open air enclosure, 300 ft in perimeter. Dry moat surrounding enclosure, 15 ft wide. 12 ft high wall in front of moat. Hard earth substrate. Grass. Logs. One 30 ft x 12 ft cement construction used as shelter, situated 6 ft from the ground. No water observed in enclosure. Attached dens, dark and dingy. Two animals observed swaying in their cages. Animals observed being fed in the open air enclosure. Signboard and barrier present.

CHINKARA: 20 ft x 35 ft x 15 ft cage. Fencing on two sides and roof. Two sides cemented. Cement substrate. Food trough. Straw observed on the ground. No water observed. One animal observed. No signboard and barrier.

HIPPOTAMUS: Triangular paddock with sides, 60 ft, 60 ft and 80 ft. Hard earth substrate. Trees. Water pool, 25 ft x 45 ft. Attached den. No fodder observed. Six animals observed, including one bax. Signboard and barrier present.

AFRICAN CAPE BUFFALO: 25 ft x 50 ft paddock. Cement and earth substrate. Trees. Cement food trough, 20 ft x 2 ft. Triangular water reservoir with sides 5 ft, 4 ft and 6 ft. Tap inside reservoir. Attached enclosure, 210 ft x 80 ft with earth substrate and vegetation and 20 ft water moat in front. Shelter attached to this enclosure. Six animals observed in the 25 ft x 50 ft paddock. Signboard present but no barrier.

COMMON LANGUR: Triangular cage of sides, 15 ft, 15 ft and 14 ft. White sand and cement substrate. Roof partly cemented. Straw and log. One hanging rope. No

food and water observed. Two animals observed. Signboard and barrier present.

LION-TAILED MACAQUE: Triangular cage with sides 15 ft, 15 ft and 14 ft. White sand and cement substrate. Roof partly cemented. Straw and log. One hanging rope. No food and water observed. Two animals observed. Signboard and barrier present.

BLACKBUCK: 160 ft x 50 ft paddock. Earth substrate. Trees. No shelter. No fodder or water inside. 40 animals observed. No barrier and signboard.

INDIAN RHINOCEROS: Paddock, 500 ft in perimeter. 12 ft wide water moat in front of enclosure. Earth substrate. Trees. Water pool, 30 ft x 40 ft. One shelter, 25 ft x 12 ft. Food trough. Fodder observed, but no drinking water. Two animals observed. Signboard and barrier present.

SIKA DEER: 140 ft x 100 ft paddock. Water moat surrounding land, 15 ft wide. Earth substrate. Trees. Attached cement shelter, 20 ft x 30 ft x 14 ft. Two animals observed. Signboard and barrier present.

LEOPARD CAT: Hexagonal cage with sides of 7 ft and 12 ft high. Nylon netting and thatch covering over roof. Earth substrate. Logs, straw and plants. One cement platform, 7 ft x 4 ft, situated 6 ft from the ground. Attached den, 7 ft x 5 ft x 6 ft. No food or water observed. Two animals observed. Signboard and barrier present.

FISHING CAT: Hexagonal cage with sides of 7 ft and 12 ft high. Nylon netting and thatch covering over roof. Earth substrate. Logs, straw and plants. One cement platform, 7 ft x 4 ft, situated 6 ft from the ground. One circular dry reservoir, 4 ft in diameter. Attached den, 7 ft x 5 ft x 6 ft. No food or water observed. Two animals observed. Signboard and barrier present.

RED LECHWE: 180 ft x 180 ft paddock. Earth substrate. Trees and bushes. Attached shelter. No water observed in enclosure. One animal observed eating fodder. Signboard and barrier present.

HIMALAYAN BLACK BEAR: Semi circular open air enclosure, 100 ft in diameter. 10 ft wide dry moat in front. 12 ft high wall in front of moat. Earth substrate. Grass, plants and logs. Cement shed, 30 ft x 20 ft, situated 8 ft from the ground. Attached den. No food or

water observed in enclosure. One animal observed. Signboard and barrier present.

Birds

EDWARDS' PHEASANT: 10 ft x 12 ft x 8 ft cage. Roof of cage partially covered with fine netting. Earth substrate. Bushes and logs. Elevated cement platform, 10 ft x 4 ft. Roof of platform serving as shelter with walled back. Straw. Wooden box. Food strewn on the cage floor. Water bowl. Two birds observed, one male and one female. Signboard and barrier present.

KALEEJ PHEASANT: 10 ft x 12 ft x 8 ft cage. Roof of cage partially covered with fine netting. Earth substrate. Bushes and logs. Elevated cement platform, 10 ft x 4 ft. Roof of platform serving as shelter with walled back. Straw. Wooden box. Food strewn on the cage floor. Water bowl. Three birds observed, one male and two females. Signboard and barrier present.

GREEN IMPERIAL PIGEON: Triangular cage, sides, 18 ft, 15 ft and 15 ft and 14 ft high. Earth substrate. Logs. Straw. Cement platform at the back of cage. Bamboo perch. No food and water observed. One bird observed. Signboard and barrier present.

GREAT HORNED OWL: 6 ft x 6 ft x 6 ft cage. Earth substrate. Plants and logs. Bamboo perch. Mud water pot. No food observed. Two birds observed. Signboard and barrier present .

SCARLET MACAW: 18 ft x 15 ft x 14 ft cage. Earth substrate. Logs. Straw. Cement platform at the back of cage. Bamboo perch. No food and water observed. Two birds observed. Signboard and barrier present.

Reptiles

SIAMESE CROCODILE & SPECTACLED CAIMAN: 40 ft x 60 ft open air enclosure. Earth substrate. Elliptical water pool, 30 ft major axis. Rock islands in pool. Cement shelter. Dry moat surrounding elevated dry area which is 2 ft high. Two Siamese Crocodiles and five Spectacled Caimans. Signboard present but no barrier.

AMERICAN ALLIGATOR: 45 ft x 55 ft open air enclosure. Earth substrate. Plants. Cement shelter. Elliptical water pool, 30 ft major axis. Two islands within pool area. Two animals observed. Signboard present but no barrier.

ROCK PYTHON: 15 ft x 10 ft x 5 ft glass fronted enclosure with cement roof and sides. Hard earth substrate. Two logs. Straw. No water reservoir but tap inside. No food observed. Two snakes observed. Signboard and barrier present.

KING COBRA: 12 ft x 10 ft x 5 ft glass fronted cage with cement roof and sides. Hard earth substrate. Three logs. Straw on the ground. Two wicker baskets. No water reservoir but tap inside enclosure. One snake observed. Signboard and barrier present.

COMMON MONITOR LIZARD: 7 ft x 10 ft x 5 ft glass fronted enclosure with cement roof and sides. Hard earth substrate. Straw on the ground. Logs. One wooden box. No water observed in enclosure. One animal observed. Signboard and barrier present.

COMMENTARY

Delhi Zoo is a mixture of modernity and antiquity.

Some of Delhi Zoo's enclosures (e.g., herbivores) are very large and acceptable, while others (e.g., small carnivore cages) are inadequate and fail to satisfy even the basic biological and behavioral needs of the animals they contain. A number of animals are kept singly. The single chained African elephant presents a very distressing picture. Being India's national Zoo, it seems extremely odd that single animals like the Hoolock Gibbon have been living in isolation for years without the Central Zoo Authority intervening.

Educational efforts are nominal with signboards predominating. There was no indication of any organized keeper talks or audio-visual shows.

While the conservation value of the Zoo is questionable, it should be commended for cooperating with animal welfare organizations and taking in rescued animals.

Size: Large enclosures for herbivores. Some carnivore cages and bird cages too small.

Substrate: Mainly earth, but cement substrates do exist.

Furnishings/Enrichment: Nominal.

Educational Graphics: The general Zoo kind, nothing exceptional or noteworthy.

Safety: Adequate in most cases but people observed feeding animals and climbing the boundary of the American Alligator enclosure. Such actions could result in deaths.

CONCLUSIONS

Delhi Zoo appears to have a reasonably good standard of animal housing and husbandry. There are however, some problematic areas. They include some exhibits that are in need of improvement and single animals kept isolated from others of their own kind. For example, the Hoolock Gibbon is kept alone in a very cramped enclosure and the single African elephant is inappropriately chained. As well, the small carnivore cages seem to be in a state of disrepair. The Great Horned Owl cage is pitifully small and there is an overpopulation of herbivores, such as Blackbuck. There are surplus birds of many common species.

RECOMMENDATIONS

1. The Zoo should stop breeding all animals, especially some of the herbivores that are already in a surplus situation.
2. The Fishing cat and Leopard cat cages should be removed and more appropriate enclosures built for those species.
3. An institution wide program of environmental enrichment should be developed and implemented.
4. The elephants should be allowed free movement throughout their paddock and should not be kept on chains.
5. All animals should be provided appropriate social environments. Social animals should not be kept alone. The single African elephant should be moved to Mysore Zoo (the only other Zoo in India housing African elephants) or another facility abroad housing this species. Reportedly, Delhi Zoo was trying to procure another African elephant as a companion. The Zoo should abandon this plan as the elephants would still be in an abnormal social situation.
6. Signboards should be improved and other kinds of educational programming developed.

PESHWE PARK ZOO

Punk, Maharashtra—November 12, 2002

INTRODUCTION

Peshwe Park Zoo is a small, traditional Zoo situated in Poona. The Zoo was started at a location somewhat far from the city center, but since its inception, the city of Poona has observed a great development and expansion and now the Zoo is surrounded on all sides.

ANIMAL HOUSING AND HUSBANDRY

Mammals

BLACKBUCK: Triangular paddock with sides measuring approximately 65 ft x 50 ft x 50 ft. Soil substrate with grass and trees. Circular cement water bowl 1.5 ft in diameter. Cement food trough. Attached shelter with cement floor and roof. One male individual observed. Signboard present but no stand-off barrier.

BLACKBUCK: Triangular paddock, having sides 65 ft x 50 ft x 50 ft. Soil substrate with grass and trees. Circular cement water bowl, 1.5 ft in diameter. Cement food trough. Attached shelter with cement floor and roof. One male individual observed. Signboard present but no barrier.

CHINKARA OR INDIAN GAZELLE: Triangular paddock with sides 65 ft x 50 ft x 50 ft. Soil substrate with grass and trees. Circular cement water bowl 1.5 ft in diameter. Cement food trough. Attached shelter with cement floor and roof. One individual observed. Signboard present but no barrier.

ALBINO BLACKBUCK: Triangular paddock with sides 65 ft x 50 ft x 50 ft. Soil substrate with grass and trees. Circular cement water bowl 1.5 ft in diameter. Cement food trough. Attached shelter with cement floor and roof. One male individual observed. Signboard present but no barrier.

ORANGUTAN: Cage measures approximately 20 ft x 10 ft x 12 ft. Cement substrate. Two wooden platforms and iron framework inside cage. One swing and one iron ladder. Dry cement water reservoir, circular in shape and 1 ft in diameter. One attached den. A single animal was observed. According to the signboard, this animal was brought from an Australian Zoo years ago. This animal has been leading a solitary life for sometime now and no efforts have been made to find a companion for this animal or relocate it to a better facility. The orangutan seemed to be listless and bored. Visitors were observed taunting and teasing the animal at will. Signboard and barrier present.

TIGER: Oval cage, major axis 50 ft and 15 ft high, divided into two parts. Soil substrate. Other than one log the cage was entirely barren. Dry water pool, triangular in shape having sides 6 ft x 7 ft x 9 ft, in one half of the cage. The other half had no water pool. Attached den. One animal in each section of cage. Both animals observed pacing. Visitors disturbing animals. Signboard and barrier present.

LION TAILED MACAQUE: Cage measures about 22 ft x 10 ft x 14 ft. Cement substrate. Roof of cage partially covered with tin. Several logs and one triangular wooden platform. Cement water reservoir .5 ft x 1.5 ft. No food observed inside cage. Attached den. One animal observed. Macaque observed pacing on the cement floor. Signboard and barrier present.

LEOPARD: Cage measuring approximately 25 ft x 14 ft x 10 ft high. Cement substrate. Logs in exhibit, but no living vegetation. Attached den. Cement water pool, 8 inches x 6 inches. One animal observed. Signboard and barrier present.

WHITE TIGER: 120 ft x 30 ft open air enclosure with 14 ft high fencing. Soil substrate, grass growing inside. No trees. Water pool, 8 ft x 12 ft with water approximately

6 inches deep. Attached den with iron-barred window, light tubes and exhaust fans. One animal observed. Visitors observed and video recorded pelting the animal with stones. Signboard and barrier present.

WHITE TIGER: 120 ft x 30 ft open air enclosure with 14 ft high fencing. Soil substrate, grass growing inside. No trees. Water pool, 7 ft x 10 ft with water approximately 4 inches deep. Attached den with iron barred window, light tubes and exhaust fans. One animal observed. Signboard and barrier present.

LEOPARD: Cage measuring approximately 25 ft x 20 ft x 10 ft. Cement substrate. No environmental enrichment in the form of logs or living vegetation. Raised wooden platform, triangular in shape. One attached den inside. One animal observed. Signboard and barrier present.

SLOTH BEAR: 25 ft x 20 ft x 10 ft cage. Cement substrate. Logs on the floor. Triangular wooden platform, similarly raised as the leopard cage. Attached den. Signboard and barrier present.

Birds

COMMON PEAFOWL: 24 ft x 18 ft x 15 ft cage. Cement substrate. One plant. Three logs. One platform made of iron and asbestos at the back of the cage. Back of cage partially covered with asbestos. Asbestos covering on roof. Tap inside cage. Circular clay water pot, 6 inches in diameter. Three birds observed; one male and two females. Signboard and barrier present.

ALBINO PEAFOWL: 24 ft x 18 ft x 15 ft cage. Cement substrate. One plant. Three logs. One platform made of iron and asbestos at the back of the cage. Back of cage partially covered with asbestos. Asbestos covering on roof. Tap inside cage. Circular clay water pot, 6 inches in diameter. Four birds observed. Signboard and barrier present.

CHINESE SILVER PHEASANT: 8 ft x 10 ft x 10 ft cage. Cement substrate and roof with a small wired portion. Cement water pool, 1.5 ft x 0.5 ft. Empty food trough. Logs and wooden platforms inside cage. Small wire cage inside, 2 ft x 2 ft x 2.5 ft. Two female birds observed. Signboard and barrier present.

CONURE: 8 ft x 8 ft x 8 ft cage. Cement substrate and logs inside. One swing. One water bowl. No food observed.

Metal platform. Tin covering on roof. Two birds observed. Signboard and barrier present. Signboard indicated the species is 'NANDY CONURE'.

INDIAN RED BREASTED PARAKEET: 8 ft x 8 ft x 8 ft cage. Cement substrate. Metal platform. Tin covering on roof. Several logs in exhibit. One swing. One water bowl. No food observed. Two birds noticed. Signboard and barrier present.

DOVE: 8 ft x 16 ft x 8 ft cage. Cement substrate. Logs inside. Wooden platform. Three mud pots. One wooden shelter. One cement water bowl. No food observed inside. Twenty birds observed, principally Spotted Doves but there might have been other species as well. Signboard and barrier present. Signboard does not elaborate on the species of birds displayed.

MOLUCCAN COCKATOO: 8 ft x 8 ft x 8 ft cage. Cement substrate. Metal platform. Tin covering on roof. Several logs in exhibit. One swing. One water bowl. No food observed. One bird observed. Signboard and barrier present.

COMMON PEAFOWL: 8 ft x 16 ft x 8 ft cage. Cement substrate. Logs. Water bowl. No food observed. Wooden platform. One female bird. Signboard and barrier present.

CASSOWARY: 120 ft x 30 ft open air enclosure with 14 ft high fencing. Soil substrate with some grass cover. No trees. Water pool, 8 ft x 12 ft with water approximately 2 inches deep. Tap inside. One tin shed as shelter with sides, 8 ft x 4 ft x 7 ft. One bird observed. Signboard and barrier present.

COMMENTARY

Peshwe Park Zoo is an ideal example of an aging, traditional city Zoo. It is immediately obvious to anybody that the Zoo is old and the conditions for the animals distressing. The orang-utan exhibit was one of the worst in the facility and a good example of how not keep wild animals in captivity. The carnivore cages are generally old and inadequate. The white tiger cages were marginally better, offering the animals more space to move around. The cassowary cage was also large providing the bird with some space to move about. The Lion-tailed macaque enclosure with its cement floor and lack of furnishings provided little for this arboreal animal to do. The herbivore enclosures were moderately spacious, as were some of the bird cages.

The big cats and sloth bear were all exhibiting pronounced stereotypic behaviours. Other animals appeared bored.

Needless to say, Peshwe Park Zoo serves little purpose as a conservation, education or research facility. The Zoo appears to exist to provide a touch of exotic flavour to an otherwise pleasant small park. It is learned that the Peshwe Park Zoo will be shifted; the sooner the better for the animals.

RECOMMENDATIONS

1. The Zoo should relocate its live animal collection to more appropriate accommodation elsewhere and close itself down.
2. As part of the close down, the orangutan should be relocated to more appropriate accommodation elsewhere, possibly Kanpur Zoo or Hyderabad Zoo.
3. The carnivores should also be relocated to a better facility, possibly the new upcoming Zoo in Katraj in Poona.
4. The Lion-tailed macaque should be sent to another Zoo, preferably Arignar Anna Zoological Park in Madras.
5. Until the Zoo is closed, a program of environmental enrichment should be developed and implemented for all animals in the Zoo.
6. All breeding of animals should be stopped.
7. Until the Zoo is closed, the Zoo should make some attempt to provide conservation education to visitors.

PIMPRI CHINCHWAD SNAKE PARK AND RESCUE CENTRE

Poona, Maharashtra—November 13, 2002

The methodology used to inspect this facility was different than the methodology used for the inspections of the other facilities contained in this report.

Mr. Anile Khaire, the director of the Pimpri Chinchwad Snake Park and Rescue Centre, is a graduate of the International Training Centre (ITCH) of Jersey Zoo. Since one of the two investigators is also a graduate of the ITCH, they decided to arrange a meeting with Mr. Khaire to discuss how his ITCH training has been put into practice at his facility. He also accompanied the investigators during their inspection and provided information about husbandry protocols and Zoo practices.

Due to time limitations, detailed notes were not taken. However, videotape of the facility was obtained.

GENERAL ADMISSION, CONCLUSIONS AND RECOMMENDATIONS

Pimpri Chinchwad Snake Park and Rescue Centre seems to be well maintained. The majority of the enclosures appear suitable for the animals they contain.

A number of animals are housed singly and should be provided with more appropriate social environments. Stereotypic behaviour (circling) was observed in a jackal.

The animal acquisition and maintenance policies may need reevaluated as some animals have been purchased specifically for public display. This practice is contrary to the philosophy of most legitimate rescue centers.

The facility maintains a good education centre aimed at sensitizing members of the public about animal conservation issues.

As a rescue centre, the work of this facility is commendable. However, it is not known exactly what species and number of animals have ever been released back to the wild. The investigators hope this facility will focus its resources and efforts on rehabilitating animals for release to the wild and will stop purchasing animals for display purposes.

PRINCE OF WALES ZOO

Lucknow, Uttar Pradesh—October 24, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- PORCUPINE:** 6 ft x 8 ft x 3 ft cage. Cement substrate. Platform. Excreta on platform and substrate. Cage extremely dark and smelly. Asbestos covering on wire roof. Food observed mingled with excreta on the substrate. No water observed. One animal observed. Signboard (in Hindi) and barrier present.
- BLACKBUCK:** 155 ft x 140 ft paddock. Soil substrate. Trees. Fenced area within enclosure housing one bax. Food and water trough. 44 animals observed. Signboard and barrier present.
- SWAMP DEER:** 170 ft x 85 ft paddock. Soil substrate. Trees. Circular water pool, 12 ft in diameter. Seven Swamp deer, one Barking deer and one Sarus crane observed. Signboard and barrier present.
- BARKING DEER:** 75 ft x 85 ft paddock. Soil substrate. Grass and trees. Water reservoir and cement food trough. Paddock densely vegetated. Thirteen animals observed. Signboard and barrier present.
- ASIATIC ELEPHANT:** Paddock with sides of 85 ft, 70 ft, 90 ft and 100 ft. Soil substrate with grass. Tin shed, 10 ft x 15 ft. Water pool, 2.5 ft x 7 ft. Dry moat surrounding enclosure, 8 ft wide. 7 ft high wall in front of moat. Attached shelter, 10 ft x 15 ft x 12 ft. One male specimen observed. The animal had rings attached on the ends of his tusks. Signboard and barrier present.
- ALBINO RHESUS MACAQUE:** 7 ft x 12 ft x 8 ft cage. Dry soil substrate. Cement platform at the back of cage. Attached den. Food and water pots observed. One animal observed. Signboard (in Hindi) and barrier present.
- BROWN CAPUCHIN MONKEY:** 7 ft x 12 ft x 8 ft cage. Dry soil substrate. Cement platform at the back of cage. Attached den. Food and water pots observed. Four animals observed. Signboard (in Hindi) and barrier present.
- SLOTH BEAR:** 85 ft x 65 ft open air enclosure. Soil substrate with thick grass. Trees. Dry moat in front of land area, 8 ft wide. 10 ft high wall in front of moat. Four attached dens. One animal observed stereotyping (swaying) in one of the dens. Signboard and spiked barrier.
- LEOPARD:** 8 ft x 7 ft x 8 ft cage. Cement substrate. Thatch covering on wire roof. Attached den. No food or water observed. One animal observed sleeping. Signboard and barrier present.
- HIMALAYAN BLACK BEAR:** 16 ft x 7 ft x 8 ft cage. Cement substrate. Water reservoir, 2 ft x 3 ft with 6 inches deep water. Tap inside. Attached den. One animal observed inside den. Signboard (in Hindi) and barrier present.
- HIMALAYAN BLACK BEAR:** Circular open air enclosure, 50 ft in diameter. Soil substrate. Grass and trees. Triangular water pool with sides, 12 ft, 14 ft and 18 ft. Dry moat surrounding land area, 7 ft wide. 10 ft high wall in front of moat. Attached den. Two animals observed. Signboard and barrier present.
- SANGAI & ROSY PELICAN:** Circular paddock, 500 ft in circumference. Dense forest. Water pool, 12 ft x 50 ft. Attached shelter. Two Sangai and two Rosy pelicans observed. Signboards for both species and barrier present.
- HOOLOCK GIBBON:** 40 ft x 35 ft x 18 ft cage. Soil substrate. Trees. Metal rods. Attached den. No food or water observed. Two animals observed; one male and one female. Signboard and barrier present.

GIRAFFE: 100 ft x 80 ft paddock. White sand substrate. Trees. Two attached shelters, each measuring 12 ft x 12 ft x 14 ft. No food or water observed. One animal present. Signboard and barrier present.

WOLF: 7 ft x 14 ft x 8 ft cage. Soil substrate. Cement roof. Water pool, 1 ft x 1 ft, with very little water. Excreta on the floor. Attached den. No food observed. One animal observed circling. No signboard but barrier present.

STRIPED HYENA: 7 ft x 14 ft x 8 ft cage. Substrate part soil and part cement. Cement roof. Water pool, 1 ft x 1 ft. Wooden platform inside cage. No food observed. One animal observed pacing. Signboard and barrier present.

WHITE TIGER: Circular open air enclosure, 350 ft in circumference. Soil substrate. Dense vegetation inside enclosure. No water facility. Attached den. 12 ft high wall surrounding enclosure. One animal observed pacing. Signboard and barrier present.

HIPPOPOTAMUS: 20 ft x 40 ft paddock. Cement substrate. 20 ft x 30 ft pool with dirty, odorous water. Attached shelter. No food observed in enclosure. One animal observed. Signboard and barrier present.

Birds

ROSY PASTOR: Hexagonal cage, 36 ft perimeter by 7 ft high. Cement floor and roof. Dirty straw inside. Soiled nesting box and logs. One filthy food pot. One water pot with dirty water. 11 birds observed. Birds were unkempt with soiled feathers and dirty feet. Signboard present but no barrier.

JAPANESE QUAIL & TREE PIE: 12 ft x 10 ft x 8 ft cage. Hard, dry soil substrate. Two bamboo perches. One wooden hut. Back of cage walled. Cage extremely dirty with leftover food and excreta. Jagged wire observed in cage fencing. Empty pots for food and water. One Japanese Quail and one Tree Pie inside. No signboard or barrier present.

SILVER PHEASANT: 8 ft x 8 ft x 5 ft cage. Asbestos covering on wire roof. Cement substrate soiled with excreta. Back of cage walled. Leftover food inside. Water bowl. One male bird observed. Signboard and barrier present.

BLACK-NECKED STORK: 75 ft x 35 ft open air enclosure. Soil substrate. Dense vegetation. 8 ft wide dry moat surrounding land area. Two birds observed. Signboard and barrier present.

EMU: Triangular paddock with sides measuring approximately 75 ft, 70 ft and 45 ft. Soil substrate. Densely vegetated enclosure. One tin shed. Attached shelter. No food or water observed. Two birds observed. Signboard and barrier present.

AVIARY: Circular cage, 250 ft in circumference. Pond and island inside. Trees and other vegetation present. Species observed include White Ibis, Painted Stork, Rosy Pelican, Flamingo, White Stork, Black Necked Stork, Spoonbill, Demoiselle Crane, Sarus Crane, Common Crane, Purple Moorhen and Coot. Signboard and barrier present.

BLACK CAPPED LORY: 8 ft x 10 ft x 5 ft cage. Cement substrate and cement shelter. Cement platform. Broken perch. Dirty straw in cage. No food or water observed. One bird observed. The black cap of the bird has white streaks (sign of disease?). Signboard and barrier present.

GREAT INDIAN HORNBILL: 10 ft x 10 ft x 12 ft cage. Soil substrate. Brick shelter. Food and water trays on the ground. Small rusted perch. Jagged wire observed on fencing. Cage fencing rusting. Two mongooses observed entering through gap in perimeter fencing and eating food. One bird observed. Signboard and barrier present.

Reptiles

COMMON SAND BOA: Triangular glass fronted cage with sides, 6 ft, 6 ft and 5 ft and 5 ft high. Cement wall on one side and another wired. Cement roof. Hard, dry, soil substrate. Water bowl, 1 ft in diameter. Six snakes observed. Signboard says 'Earth Snake'. Barrier present.

MONITOR LIZARD: 8 ft x 8 ft x 6 ft glass-fronted cage. Cement roof and sides. Small square opening on the roof. Hard soil substrate. One log, stones and one water bowl present. No food noticed. One animal observed. Signboard and barrier present.

GHARIAL: Circular open air enclosure, 300 ft in circumference. Elliptical land area of 50 ft major axis. Trees and logs. Surrounding water pool, 8 ft wide. Six reptiles observed. Signboard (in Hindi) and barrier present.

COMMENTARY

Lucknow Zoo is a typical, traditional city Zoo. It consists primarily of old-style cages and a few open-air enclosures. The Zoo's animal collection is large and comprehensive. Cage and enclosure designs do not satisfy modern standards of Zoo husbandry. Much of the enclosure fencing is damaged or rusting and most cages appear unkempt and dirty. Stereotypic behaviours were observed in all carnivores and primates. Educational efforts are limited to signboards. There do not seem to be any formal conservation breeding or rehabilitation/reintroduction programs.

Size: Inadequate for most animals. The leopard and Himalayan black bear exhibits are particularly small. The open-air enclosures are also cramped.

Substrate: Primarily cement and soil (much of it hardpan).

Furnishings/Enrichment: Poor or absent.

Educational Graphics: Poor.

Safety: Inadequate. Drunken patrons harassed the investigators.

CONCLUSIONS

Lucknow Zoo is a menagerie whose only purpose is entertainment. The facility is poorly maintained and supervision is minimal. A significant number of animals are kept in substandard conditions, such as the single leopard and the Himalayan black bear. There is no valid conservation or education messaging for visitors. Lucknow Zoo has also sold hippos to a circus, a sign that the philosophy and practices of the Zoo is not in line with serious, modern Zoos.

RECOMMENDATIONS

1. Where possible, animals currently kept in poor conditions should be shifted to other Zoos with better facilities or provided better enclosures.
2. The Zoo should downsize its live collection by halting all breeding of animals.
3. An institution-wide program of environmental enrichment should be developed and implemented
4. All animals should be provided with appropriate social environments.

5. All animals should be provided with clean, drinking water at all times.
6. All heavily rusted, broken and/or damaged fencing and/or barriers should be repaired or replaced.
7. The reptile cages should be refurbished.
8. Educational signboards should be improved and other educational programs developed.
9. Visitor supervision and Zoo security should be improved.

RANCHI ZOO

Ranchi, Jharkhand—October 15, 2002

INTRODUCTION

Bhagwan Birsa Biological Park is situated about twenty kilometers from the city of Ranchi in the state of Jharkhand. The Zoo was reportedly starting to provide natural surroundings for captive animals held in Zoos of Bihar (Jharkhand was previously a part of Bihar). The Zoo is located among pristine deciduous forest and seeks to aid the cause of animals through conservation, education and recreation. The Zoo is owned by the government.

ANIMAL HOUSING AND HUSBANDRY

Mammals

TIGER: 110 ft x 115 ft open air enclosure. 14 ft high fencing. Soil substrate with grasses and trees growing. One circular water pool, 5 ft in diameter. Water moat in front of cage, 10 ft wide. 15 ft deep front wall. Two attached cages, circular, 10 ft in diameter x 8 ft high. These cages had hard soil substrate and straw on the wire roof. Each cages held one tiger. Both animals were observed pacing continuously. Signboard and barrier present.

LEOPARD: Oval cage, major axis 85 ft x 16 ft high. Soil substrate and grasses growing. No trees inside. Wire roof with straw on top. Attached shelter with four entrances, each 1.5 ft x 2.5 ft. One water pool, 3 ft x 7 ft. No food observed in cage or shelter. One animal observed. Signboard and barrier present.

LEOPARD: Oval cage, major axis 20 ft and 10 ft high. Sand substrate. Wire roof with straw overhead. Circular cement water bowl, 1.5 ft in diameter. Two animals observed. Signboard and barrier present.

LEOPARD: Oval cage, major axis 20 ft and 10 ft high. Sand substrate. Circular cement water bowl, 1.5 ft in diameter. One animal observed. Signboard and barrier present.

STRIPED HYENA: Open air enclosure, 150 ft x 90 ft with 15 ft high fencing. Soil substrate with grasses, bushes and trees growing profusely. Water moat in front of enclosure, 10 ft wide. 12 ft high wall in front of moat. No animal observed. No signboard and barrier.

COMMON LANGUR: Circular cage, 13 ft in diameter x 10 ft high. Soil substrate. Wire roof with straw on top. Circular water bowl, 1 ft in diameter. Artificial cement branches inside cage. Attached den with 1 ft x 1 ft entrance. One animal observed. No signboard but barrier present.

INDIAN PORCUPINE: Circular cage, 13 ft in diameter x 10 ft high. Soil substrate. Wire roof with straw on top. Circular water bowl, 1 ft in diameter. Attached den with entrance 1 ft x 1 ft. Two animals observed, one of them pacing. Signboard and barrier present.

LEOPARD CAT: Circular cage, 13 ft in diameter x 10 ft high. Soil substrate. Wire roof with straw on top. Circular water bowl, 1 ft in diameter. Attached den with entrance, 1 ft x 1 ft. No animal observed. Signboard and barrier present.

JUNGLE CAT: Circular cage, 13 ft in diameter x 10 ft high. Soil substrate. Wire roof with straw on top. Circular water bowl, 1 ft in diameter. Attached den with entrance, 1 ft x 1 ft. No animal observed. Signboard and barrier present.

LION: Open air enclosure, 150 ft x 120 ft fence. Soil substrate, grasses, trees and bushes growing in profusion. Dry moat in front of enclosure, 10 ft wide. 12 ft high wall at front of moat. Attached dens having four entrances, each 1.5 ft x 2 ft. No animal observed. Signboard and barrier present.

LION: Two circular cages, attached to the open air enclosure. Each cage 10 ft in diameter x 8 ft high. Both cages have sand substrate. No food observed in either cage. Cement water bowls in both cages, each bowl 1 ft in diameter. One male animal observed in one cage and two females in the other cage. Signboard and barrier present. Animals very possibly African or hybrid.

STRIPED HYENA: 140 ft x 70 ft open air enclosure. Dense forest inside enclosure with various indigenous species of trees. Dry moat surrounding enclosure, 5 ft wide. No water facility observed in this enclosure. Attached dens. Five animals observed. A conversation with a keeper revealed there are nine animals in this cage, five adults and four juveniles, the animals having bred in captivity. Signboard and barrier present.

SLOTH BEAR: Oval open air enclosure, major axis 140 ft. Soil substrate. Trees and bushes inside enclosure. Dry moat surrounding enclosure, 6 ft wide. Moat's front wall approximately 8 ft in height. Attached den, 25 ft x 8 ft x 8 ft. Five entrances to the den, each measuring 2 ft x 2.5 ft. No food or water observed in enclosure or den. Two adult animals observed in open air enclosure. One juvenile animal kept isolated in a 4 ft x 2 ft x 3 ft cage. This animal was showing extreme stereotypic behaviour, variously head bobbing, swaying and self-mutilating. This cage was housed inside the shelter attached to the open air enclosure. The keeper was observed wrestling with the bears in the open air enclosure. Photographs and video footage of this action were obtained on the site. Signboard and barrier present. Diet chart for animals presented in front of cage : Milk - 1.625 kg. Rice -2kg. Jaggery -150g.

HIMALAYAN BLACK BEAR: Ova or axis. Soil substrate. Trees and bushes inside enclosure. Dry moat surrounding enclosure, 6 foot wide. Front wall of moat approximately 8 ft high. Attached den, 25 ft x 8 ft x 8 ft. Five entrances to the den, each measuring 2 ft x 2.5 ft. Five animals observed, three juveniles in holding cages and two adults in the open air enclosure. One juvenile observed hanging from metal framework inside cage. Signboard and barrier present. Diet chart for animals displayed: Milk-1.5kg 40 bananas 28 slices of bread.

STRIPED HYENA: Oval open air enclosure, 150 ft major axis. Densely forested enclosure with 6 ft wide surrounding dry moat. 8 ft high wall surrounding enclosure. Attached den. Keeper stated there is a single lame animal kept inside the den. This animal was not

observed. No signboard in front of enclosure but barrier present.

SAMBAR: 130 ft x 135 ft open air enclosure. Soil substrate and grass growing. Logs and water pool. One shed with straw roof, 10 ft x 12 ft x 5 ft. Two male animals observed. Signboard and barrier present.

NILGAI: 120 ft x 100 ft open air enclosure. Dry soil substrate. Vegetation inside. One water pool, 3 ft x 5 ft. No shelter. 6 ft high surrounding wall. Eight animals observed. Signboard and barrier present.

BARKING DEER: 110 ft x 110 ft open air enclosure. Soil substrate with grass growing. Trees inside. No water facility observed in enclosure. Two attached cages, each 6 ft x 8 ft x 8 ft. One animal in each cage. Browse given in containers inside cages. A keeper informed that three deer have been killed by stray dogs in the open air enclosure and so the remaining animals are no longer left in the open air enclosure. They are permanently kept inside the holding cages adjacent to the open air enclosure. Signboard and barrier present.

AXIS DEER: 125 ft x 160 ft open air enclosure. Dry soil substrate. Dry water pool, sides measure 3 ft x 8 ft x 14 ft x 5 ft and the other measures 10 ft x 8 ft x 5 ft. 7 ft wall in front of enclosure. Food trough with browse present. Fifteen animals observed. Signboard and barrier present.

INDIAN RHINOCEROS: 125 ft x 70 ft enclosure. Vegetation inside exhibit; large living trees. One water pool, 10 ft x 75 ft. Attached cement shelter having 6 ft x 2.5 ft entrance. One animal observed. Signboard and barrier.

RHESUS MACAQUE: Open air enclosure, island type, 15 ft x 55 ft. Eight dead, upright tree trunks inside. Grass growing in some areas. Rock shelter and rocky terrain. Surrounding water moat. Fifteen animals observed including six juveniles. Signboard and barrier present.

ASIAN ELEPHANT: One young animal observed chained in a yard. Keeper noticed in nearby shed. No water facility observed. Signboard and barrier present.

Birds

WHITE PEAFAWL: 25 ft x 30 ft x 14 ft cage. Sand substrate. Logs and plants. Cement construction inside cage. Attached shelters, having four entrances, each measuring 2 ft x 2.5 ft. No food and water observed inside cage. Five birds observed. Signboard and barrier present.

BLACK IBIS: Triangular cage, with sides measuring 30 ft , 16 ft and 16 ft and 14 ft high. Soil substrate. Triangular water pool, sides, 5 foot by 6 foot by 6 foot. Two attached shelters, each having entrance 1.5 ft x 2.5 ft. No food observed inside cage. Hole in one side of cage fencing with some jagged wire. One Black Ibis and one Cormorant observed. The cormorant was observed getting stuck in the hole in the fence while attempting to fly into the adjacent cage. Signboard only for Black Ibis. Barrier present.

COMMON PEAFAWL: Triangular cage with sides measuring 30 ft , 16 ft and 16 ft x 14 ft high. Triangular water pool, sides measuring approximately 5 ft x 6 ft x 6 ft. Two attached shelters with entrances 1.5 ft x 2.5 ft. No food observed inside cage. Logs and metal rods inside cage. Four plants. Three birds observed, one male and two females. Signboard and barrier present.

ROSY PELICAN : Triangular cage with sides measuring 30 ft , 16 ft and 16 ft x 14 ft high. Soil substrate. Triangular water pool, sides, 5 ft x 6 ft x 6 ft. Two attached shelters, each with entrance 1.5 ft x 2.5 ft. No food observed inside cage. Two birds observed. Signboard for Grey Pelican. Barrier present.

GUINEA FOWL: Triangular cage with sides measuring 30 ft , 16 ft and 16 ft x 14 ft high. Soil substrate. Triangular water pool with sides measuring approximately 5 ft x 6 ft x 6 ft. Two attached shelters, each with entrance 1.5 ft x 2.5 ft. No food observed inside cage. One bird observed. No signboard but barrier present.

Reptiles

MARSH CROCODILE: 100 ft x 30 ft pit. Gravel and sand substrate. Water pool divided in two oval parts, each having major axis of 30 ft. One reptile observed. Signboard and barrier present.

GHARIAL: 100 ft x 30 ft pit. Gravel and sand substrate. Water pool divided in two oval parts, each having

major axis of 30 ft. One reptile observed. Signboard and barrier present.

COMMENTARY

Our first impression of Ranchi Zoo was one of surprise at the fact that a captive animal facility was built in the midst of a pristine tract of natural vegetation. Having said that, this facility does seem to take some advantage of that fact by providing large open air enclosures for its animals.

Several exhibits, such as the one housing domesticated ducks, seemed out of place. Equally odd was observing one of the keepers wrestling with a Sloth Bear in front of the public.

There are many common animal species displayed and many of them are kept singly. The elephant was chained, a inappropriate form of restraint for elephants in Zoos. There was no evidence of any reIntroduction efforts having been attempted.

Signboards are all that is offered to the public for education Information on the signboards is very basic and all are written in Hindi, so many visitors won't be able to read them. The Zoo does not provide any information about whether or not it is fulfilling its goal of rescuing captive animals from Zoos in other cities. Public facilities are virtually non-existent, except for a soft drink shop.

Safety and security may be problematic. There are very few directional signboards for visitors, so they have a realistic chance of getting lost in the forest. Also, if it is true that Barking Deer have been killed by stray dogs, there is a problem with enclosure design (the dogs should not be able to get inside) and overall Zoo security.

The Ranchi Zoo should be commended for not obtaining too wide a variety of animal species. Currently, the exhibited animals are only those that are native to India. This Zoo seems to have very good potential as a rescue center for large carnivores.

RECOMMENDATIONS

1. The Zoo should ensure that all social animals currently kept alone be provided with companions or moved to more socially appropriate accommodation elsewhere.
2. In the short term, the elephant should be unchained and allowed free access to a secure paddock.
3. The Zoo should immediately relocate their elephant to another facility with other elephants and more appropriate accommodation.
4. The single langur should be released or relocated to a better facility with more appropriate accommodation and a better social environment.
5. The small cat cages need to be properly equipped. A program of environmental enrichment should be initiated for all Zoo animals.
6. There should be no further breeding of Himalayan Black Bears.
7. The Zoo should ensure that the captive breeding program for Striped Hyenas does not get out of hand, creating an unwanted surplus of these animals.
8. Big cats should only be taken in to the collection if they can be properly cared for and only if they are rescued animals. All breeding, if any, of existing big cats should cease immediately.
9. Common species of animals like domestic ducks, Neelgai, Sambar, Barking Deer, Axis Deer and Rhesus Macaques need to be phased out of the Zoo by adopting 'no new acquisitions' and 'no further breeding' policies.
10. The Zoo should discourage keepers from wrestling with potentially dangerous animals like bears. It sends the wrong kind of message to Zoo visitors.
11. Educational signboards conveying detailed information about the biology, behaviour and status in the wild of each displayed species should be developed and posted. There should be signboards in English, as well as Hindi. Guidebooks should also be made available.
12. Directional signboards need to be provided for visitors. This is particularly important in the event of an animal escape or some other kind of emergency situation.

SANJAY GANDHI BIOLOGICAL PARK

Patna, Bihar—October 12-13, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- STRIPED HYENA:** Open air enclosure, 20 ft x 55 ft. Earth substrate. One tree. 6 ft wide moat surrounding enclosure. 8 ft high wall in front of moat. Attached den with entrance 1 ft x 2 ft. Enclosure with 9 ft high fencing. No food and water observed inside. One animal observed. The animal was pacing in a figure of eight. Signboard and barrier present.
- RHESUS MACAQUE:** 12 ft x 25 ft x 18 ft cage. Brick substrate. Shed within enclosure, 6 ft x 12 ft x 8 ft. Attached den. Two upright tree trunks. One hanging tire. No food and water observed. Five animals observed. No signboard but barrier present.
- GREY LANGUR:** Oval shaped island, 40 ft major axis. Earth substrate. 15 ft wide moat in front of enclosure. Two tires. One log framework. Four attached dens, each measuring 3 ft x 3 ft x 7 ft. One shed. No food or water observed. Nine animals observed, including one juvenile. Signboard and barrier absent.
- LEOPARD:** 25 ft x 30 ft x 18 ft cage. Earth substrate. One log. No food or water observed. Two animals observed, one inside den and the other pacing. Signboard and barrier present.
- CLOUDED LEOPARD:** 25 ft x 25 ft x 18 ft cage. Earth substrate. Dry pool. Cement platform. Two logs. Attached dens. No food or water observed. One animal observed, sleeping on cement platform. Signboard and barrier present.
- LION:** Open air enclosure, 60 ft x 50 ft. Earth substrate. Grass and trees. 15 ft high fencing on three sides of enclosure. Wall in front of enclosure, 15 ft high. Attached den. No food or water observed. One male animal observed. Signboard and barrier observed. Signboard says animal was confiscated from a mobile Zoo and looks in ill health because of mobile Zoo history.
- TIGER:** 70 ft x 95 ft open air enclosure. Earth substrate with rocks, grass and trees. 15 ft high fencing on three sides of enclosure. 15 ft high wall in front of enclosure. Attached den. No food or water observed. Two animals observed, one pacing. Signboard and barrier present.
- HIMALAYAN BLACK BEAR:** Open air enclosure, 35 ft x 30 ft. Earth substrate. Logs. One shed. Dry pool. Two attached dens, each with an entrance measuring 1.5 ft x 2.5 ft. No food or water observed in open air enclosure. Three animals observed, one inside a den. One animal observed weaving constantly. Signboard and barrier present.
- BURCHELL'S ZEBRA:** 70 ft x 220 ft paddock. Earth substrate. Grass, trees and other vegetation. Attached shelters. No water trough observed in enclosure. Two animals observed. No barrier but signboard present.
- GOLDEN CAT:** 18 ft x 45 ft x 9 ft cage. Earth substrate. Three trees inside cage. Attached den. Two cages inside, each measuring 8 ft x 10 ft x 8 ft. No food or water observed. One animal observed. Signboard and barrier present.
- HIPPOPOTAMUS:** 45 ft x 60 ft open air enclosure. Water area, 30 ft x 60 ft. Water flowing from pipes inside enclosure. Earth substrate. Grass inside. Attached den. No food observed in enclosure. Two animals observed in water. Signboard present but no barrier.
- SANGAI:** Triangular enclosure, sides, 35 ft x 50 ft x 55 ft. Earth substrate. Barren enclosure without vegetation. No food or water observed. One female inside. Crows disturbing the animal. No signboard but barrier present.

LION TAILED MACAQUE: Island, 200 ft x 40 ft. Earth substrate. Trees and grass inside. Attached dens. Water moat in front of island. Three animals observed, including one juvenile. Signboard and barrier present.

SAMBAR: 115 ft x 180 ft paddock. Earth substrate. Barren enclosure with a few trees. Shed and shelter inside. Food trough observed. No water facility noticed. 50 animals observed. Signboard present but no barrier.

INDIAN RHINOCEROS: 340 ft x 180 ft paddock. Enclosure divided in two parts. Earth substrate and vegetation inside. Pond forming the front perimeter of enclosure, 20 ft wide. Food and water observed inside enclosure. Five animals observed, including one bax. Signboard and barrier present.

STRIPED HYENA: Triangular cage with sides, 40 ft, 50 ft and 40 ft and 6 ft high. Earth substrate. Barren cage. Attached den. Meat on the floor, teeming with flies. No water observed. One animal observed. No signboard and barrier.

JACKAL: Triangular cage with sides 40 ft, 50 ft, 40 ft and 6 ft high. Sand substrate. Holes on the cage floor. Attached den. Cage has bad smell. No food or water observed. Two animals observed, one animal pacing. Signboard and barrier present.

Birds

LADY AMHERST'S PHEASANT: 18 ft x 23 ft x 12 ft cage. Earth substrate. Plants. Bamboo perches. Cement shed, 18 ft x 5 ft x 10 ft. Two cement boxes. Food strewn on the floor. No water observed. Six birds observed: three males and three females. No signboard and barrier.

RAPTOR CAGE: 10 ft x 10 ft x 8 ft cage. Roof of cage partially cemented. Hard earth substrate. One perch framework. No food or water observed. Birds include one Kestrel, three Black-winged Kites and two Shikras. No signboard but barrier present.

LESSER PIED HORNBILL: 10 ft x 8 ft x 8 ft cage. Roof of cage partially cemented. Hard earth substrate. One wooden framework inside. Two potted plants. No food or water observed. One bird noticed. No signboard but barrier present.

BARE-EYED COCKATOO: 10 ft x 8 ft x 8 ft cage. Roof of cage partially cemented. Hard earth substrate. One wooden framework inside. Two wooden boxes. No food or water observed. Two birds noticed. No signboard but barrier present.

HILL MYNAH: 10 ft x 8 ft x 8 ft cage. Roof of cage partially cemented. Hard earth substrate. One wooden framework inside. One metal perch. Four wooden boxes. No food or water observed. Four birds noticed. No signboard but barrier present. People disturbing birds.

SARUS CRANE: 55 ft x 25 ft x 20 ft cage. Rotten leaf substrate. Trees. Cement hut inside. Water bowl present but no food. Two birds observed. No signboard and barrier.

BLACK-NECKED STORK: Hexagonal cage with sides of 9 ft and 20 ft high. Tin roof. Sand substrate. Dead fish on the floor. Water bowl. One bird observed. Signboard present but no barrier.

EMU: 40 ft x 45 x 6.5 ft cage. Cage divided in two halves. Sand substrate. Dry pools in both parts of the cage. Attached shelter. No food or water observed. Two birds in one part of the cage, three birds in the other part. Signboard and barrier present.

Reptiles

SOFT-SHELLED TURTLE: 7 ft x 1.5 ft x 4 ft aquarium. Cement floor. Rocks on the floor. No dry area for basking. Three turtles and one catfish observed. No signboard but barrier present.

MONOCELLATE COBRA: 8 ft x 7 ft x 8 ft cage. Sand substrate. Log. Tiny water pool. Water pipe attached inside cage. Light bulb inside. No shelter. One snake observed. Signboard and barrier present.

ROCK PYTHON: 8 ft x 7 ft x 8 ft cage. Sand substrate. Log. Tiny water pool. Water pipe attached inside cage. Light bulb inside. No shelter. Live guinea pig inside cage. One snake observed. Signboard and barrier present. Signboard says Indian Cobra.

ROCK PYTHON: 10 ft x 8 ft x 8 ft enclosure. Sand substrate. Tiny water pool. No food or water. Four snakes observed. No signboard but barrier present.

COMMENTARY

Patna Zoo is a conventional city Zoo with a varied collection of animals. The Zoo is situated very close to the city airport and there are natural tracts of undisturbed land surrounding the animal holding facilities.

The animals are housed in a mixture of open air enclosures and cages organized in taxonomic groups. Most of the exhibits seem adequate enough to satisfy the basic for biological and behavioural needs of the animals they contain.

While visitor facilities are adequate, there does not seem to be very much focus on education programming or conservation initiatives.

Size: The enclosures are generally adequate in size, except for the cages holding jackals and the Striped hyena. The leopard cages should be expanded.

Substrate: Primarily earth, but cement and brick substrates are found in a number of cages.

Furnishings/Enrichment: The majority of enclosures did not have any environmental enrichment. Where enrichment does exist, it is inadequate and ineffectual.

Educational Graphics: Basic.

Safety: Appeared adequate throughout facility.

CONCLUSIONS

Patna Zoo is a conventional Zoo serving the entertainment needs of the populace. It appears to focus on large, popular animals that attract crowds and does not seem to have a very strong education or conservation role.

There is no information about why the animals are held captive or where they came from. In some cases, it appears that animals have been obtained from dealers. The investigators believe that some, if not all, of the birds of prey have been acquired from the animal fair at Sonapur.

RECOMMENDATIONS

1. The Zoo should downsize its live collection allowing existing resources to be devoted to fewer animals.
2. A significant number of exhibits (including most of the bird cages) should be expanded.
3. The old-style cages should be phased out and replaced with more appropriate types of accommodation. The jackal and hyena cages should be dismantled.
4. The cement and brick substrates should be replaced with soft substrates.
5. An institution wide program of environmental enrichment should be developed and implemented.
6. Animals kept singly should be provided with appropriate social environments.
7. Proper supervision is needed at some of the bird cages where stand-off barriers are situated too close to the cages, until such time as those barriers can be moved. Visitors were observed poking the birds.
8. Signboards should be improved and other kinds of educational programming developed.

SHIMOGA SAFARI AND ZOO

Shimoga, Karnataka—August 15, 2002

INTRODUCTION

Shimoga Safari and Zoo is a government-owned facility situated in the state of Karnataka. The park is located in a place called Thavare Koppa in the small town of Shimoga. The park has a safari area for lions and tigers and a small Zoo adjacent to the safari.

ANIMAL HOUSING AND HUSBANDRY

Safari

The safari at Shimoga Zoo covers an area of approximately 500 acres according to staff members. It is divided into three parts: Lion Safari, Tiger Safari and Herbivore Safari. The bus tour through these areas took about 30 minutes. Ten tigers, three lions and more than fifty ungulates were observed during the tour. Herbivore species observed include Blackbuck and Sambar. According to a forest guard, there are eighteen tigers and three lions in the Shimoga Safari with some of them reportedly being hybrids. The safari is well vegetated with plenty of trees and shrubs growing inside the perimeter fencing.

There is a separate cage housing a male lion inside the Lion Safari. We were told that this lion, named Suresh, had been brought over from Arignar Anna Zoological Park in Madras. One lioness was observed limping. Some tigers were observed pacing the length of their enclosure fencing.

Zoo

The Zoo is situated next to the safari and has only a small number of animal species. It seemed to be more of a picnic area than a typical Zoo. The animals observed are listed below.

INDIAN GIANT SQUIRREL, INDIAN PORCUPINE & ROSE RINGED PARAKEET: 13 ft x 15 ft x 10 ft cage, divided into two parts and having cement wall at the back. Cement floor and thatched roof. Two nesting boxes: one wooden and one cement. Three nesting pots on the wall. No food or water observed. Two porcupines, two giant squirrels and two parakeets observed. The porcupines were observed huddled at the corner of the cage. One giant squirrel was observed trying to mount the other. Barrier present in front of cage. Signboards for porcupine and giant squirrel only.

RHESUS MACAQUE: Cage measuring approximately 13 ft x 15 ft x 10 ft, divided into two parts with a cement wall at the back. Cement floor and thatched roof. One circular water bowl. No food observed. Two animals observed. Animals observed pacing. No signboard. Stand-off barrier present.

LEOPARD: Cage approximately 35 ft x 25 ft x 20 ft with double netting 9 ft high. Sand substrate. One wooden log. One water facility. Attached shelter: 25 ft x 12 ft x 9 ft with three separate entrances. Three cement platforms for resting. Six animals observed including two juvenile animals. One animal observed pacing. The juveniles were locked inside the shelter and the pacing animal was observed trying to reach them through the mesh wire. Signboard and barrier present.

SLOTH BEAR: 35 ft x 30 ft x 20 ft cage. Cement floor. Single tree was the only furnishing. One water facility but no food observed. Attached den, 30 ft x 12 ft x 10 ft. Two animals observed, both pacing and biting bars. Signboard and barrier present.

STRIPED HYENA: Enclosure measured 25 ft x 20 ft enclosure. 9 ft high wire mesh. Cement floor. Dry water bowl. No food observed. Two trees and two rock platforms were the only furnishings. One attached den: 15 ft x 8 ft x 9 ft with two entrances. One animal

observed. Individual had open sores in two places. Signboard present but no barrier.

JACKAL: Pit type enclosure measuring approximately 18 ft x 15 ft. Mud substrate. No water or food observed. One wooden log and two rock platforms. One attached den, 15 ft x 8 ft x 10 ft, with two entrances. Five animals observed; one animal was pacing; others were sitting huddled on rock platform. Signboard present but no stand-off barrier.

Birds

GUINEA FOWL: Cage measuring approximately 13 ft x 15 ft x 10 ft cage, divided into two parts. Cement floor and thatched roof. One large water reservoir. Food strewn on the cage floor. Three wooden boxes inside. Two birds observed. No signboard but barrier present.

INDIAN PEAFAWL & DOMESTIC PIGEONS: 13 ft x 15 ft x 10 ft cage divided into two sections. Cement floor and thatched roof. No water facility observed. Food strewn on the ground. Three mud pots and five wooden boxes. Four Indian peafowl observed: two males and two females. The tail feathers of one bird were missing. Twenty pigeons observed. No signboard but barrier present.

ROSE RINGED PARAKEET: Cage measuring approximately 2.5 ft x 2.5 ft x 2.5 ft with tin floor and roof. One wooden box. Small aluminum water pot. No food observed. Two birds in cage. No signboard but barrier present.

FANTAIL PIGEON: 2.5 ft x 2.5 ft x 2.5 ft cage with tin floor and roof. One wooden box. Small aluminum water pot. No food observed. Two birds in cage. No signboard but barrier present.

ROSE RINGED PARAKEET: Cage approximately 2.5 ft x 2.5 ft x 2.5 ft cage with tin floor and roof. One wooden box. Small aluminum water pot. Two birds observed. No signboard but barrier present.

FANTAIL PIGEON: 2.5 ft x 2.5 ft x 2.5 ft cage with tin floor and roof. One wooden box. Small aluminum water pot. No food noticed. Two birds observed. No signboard but barrier present.

Reptiles

MARSH CROCODILE: Open air enclosure approximately 25 ft x 40 ft with 7 ft high netting. Stone bed serves as substrate. One cement water pond with 4 inch deep water. Several trees situated inside the enclosure. Three animals observed. Signboard present but no barrier.

ROCK PYTHON: Hexagonal cage, each side about 12 ft in length x 12 ft high. Sand substrate and plastic sheet over roof. One wooden log and four large stones are the only furnishings. Cement shed lining perimeter of cage approximately 2 ft wide. One mud pot containing water. Four snakes observed. Signboard present but no barrier.

COMMENTARY

Shimoga seems like an unlikely location for a Zoo and safari as it is so far off the beaten track. There were very few visitors and all of them seemed intent on having fun at the animals expense, teasing and shouting at them in the safari. Shimoga does not have a population that can sustain the park in any real way with entrance fees alone. Overall the Zoo appeared extremely shabby. This is a good example of a "forgotten" Zoo, relatively unknown and slowly falling apart, like a rusty old car that just cannot move forward.

RECOMMENDATIONS

1. Considering the remote location of Shimoga Zoo and its current state, it should take steps to wind-down its operation. All breeding of animals should stop immediately and a process of animal relocation should start as soon as possible. In the meantime, the Zoo should not acquire any additional animals.
2. The Safari could continue to function as long as the non-breeding animals are alive. As they expire, they should not be replaced allowing the safari to gradually phase itself out as well.
3. Since it is highly unlikely that Shimoga Zoo and Safari could ever shape up to modern Zoo standards, they should voluntarily pursue the right course of action.

SHRI CHAMARAJENDRA ZOO

Mysore, Karnataka—August 2 – 3, 2002

INTRODUCTION

Shri Chamarajendra Zoological Gardens in Mysore was established by Chamarajendra Wodeyar, the Maharaja of Mysore in Karnataka in 1892. Started on less than 10 acres in the summer palace premises, the Zoo has now grown to more than 100 acres. It is said to attract 2 million visitors annually according to the Zoo guidebook. It is recognized by the Central Zoo Authority of India and is one of India's oldest Zoos. The Zoo is run by the Zoo Authority of Karnataka.

ANIMAL HOUSING AND HUSBANDRY

Mammals

GIRAFFE: Open air enclosure, 170 ft x 75 ft, divided into two parts. One cement shelter, 5 ft x 10 ft x 20 ft. Grasses growing inside enclosure. Dry moat surrounding enclosure. Four animals observed, two adults and two juveniles. Food bowls and water troughs present. Signboard and barrier present.

COMMON PALM CIVET: Octagonal cage, perimeter 90 ft and 12 ft in height. Dry soil substrate. Two logs and water bowl present. Two wooden shelters. Two animals observed sleeping. Keeper observed cleaning cage. Signboard and barrier present.

LEOPARD CAT: Pit type enclosure. Oval in shape, 18 ft at major axis. 3 ft high wall with 3 ft high wire on top of wall. Double netting forms roof of cage. Cement substrate. No food or water inside cage. One log. One specimen observed. Signboard and barrier present.

COMMON PALM CIVET: Octagonal cage, 50 ft in diameter x 12 ft high. Cement substrate. Log and wooden platform inside. Wooden shelter, 2 ft x 2 ft x 2.5 ft. Water facility inside with tap. Two animals observed. Signboard and barrier present.

WALLABY: Open air enclosure, 40 ft x 40 ft. 6.5 ft high wall enclosing area. Grass substrate. One large tree inside. Cement shelter inside. Three animals observed. Barrier absent but signboard present in front of enclosure.

SIKA DEER: Open air cage, triangular in shape, with sides 35 ft, 20 ft and 30 ft. 7 ft high fencing. Grass substrate. Cement shelter with tiled roof, 8 ft x 10 ft x 8 ft. No water facility noted inside shelter. One animal observed locked inside shelter. Signboard and barrier present in front of enclosure.

FALLOW DEER: Open air enclosure divided into two parts. One part, 80 ft x 30 ft with 7 ft high fencing and second part 20 ft x 30 ft with 8 ft high fencing. Soil substrate and eight trees inside in the first half of the enclosure. Empty water reservoir. One shelter inside. One albino animal observed in the 80 ft x 30 ft enclosure. Eight animals, two juveniles and six adults observed in the 20 ft by 30 ft enclosure. This part of the enclosure has bushes and two trees. One water facility in this part. Signboard and barrier absent.

GAUR: Open air enclosure, 80 ft x 40 ft with 7 ft high wall. Mud substrate. One cement shelter with tiled roof, 7 ft x 10 ft x 8 ft. Trees and bamboo clumps inside enclosure. Six animals observed, one animal observed pacing. Signboard and barrier absent.

COMMON OTTER: 30 ft x 30 ft x 15 ft cage with wire netting as roof. Cement substrate. Water pool, 6 ft x 20 ft. Two animals observed. No food noticed inside cage. Signboard and barrier present.

RHESUS MACAQUE: Triangular cage, each side approximately 12 ft long. Cement substrate. Food strewn on the ground. No water. Two animals observed. Signboard and barrier present.

ASSAMESE MACAQUE : Triangular cage with sides approximately 12 ft long. Cement substrate. Food scattered on the ground. Dirty water pool. One animal observed. Signboard absent, but barrier present.

RHESUS MACAQUE: Triangular cage with sides approximately 12 ft long. Cement substrate. Food scattered on the ground. Circular water facility with filthy water. Two animals observed. Signboard absent, but barrier present.

RHESUS MACAQUE: Triangular cage with sides approximately 12 ft long. Cement substrate. Food strewn on ground. Dirty water pool. Two animals observed. Zoo visitors observed feeding animals. Signboard absent. Barrier present.

TIGER & LION: Open air enclosure. Circumference approximately 450 ft. Grasses and bushes inside enclosure. Large trees present. Bamboo clumps observed. Dry moat surrounding enclosure, 8 ft wide and 15 ft deep. One stone shelter within enclosure, 8 ft x 3 ft x 3 ft. One tiger observed. Signboards and barrier present.

TIGER: 15 ft x 15 ft x 18 ft cage. Cement substrate and cement roof. One wooden platform inside. No water facility inside. No animal observed. Signboard and barrier present. Cage attached to the open air tiger and lion enclosure.

TIGER: 15 ft x 15 ft x 18 ft cage. Cement substrate and cement roof. One wooden platform inside. No water facility inside. One animal observed lying inside. Signboard and barrier present. Cage attached to the open air tiger and lion enclosure.

LION: 20 ft x 15 ft x 18 ft cage. One wooden platform inside. Two wooden planks inside. One dry water facility. No food noticed. One lioness observed, most possibly Asiatic. No signboard, but barrier present. Cage attached to the open air tiger and lion enclosure.

TIGER: 20 ft x 15 ft x 18 ft cage. One wooden platform inside. Two wooden planks inside. One dry water facility. No animal observed. No signboard, but barrier present. Cage attached to the open air tiger and lion enclosure.

TIGER: 18 ft x 15 ft x 18 ft cage. One cement shelter. One dry water facility inside. One animal observed pacing. Signboard and barrier present. Cage attached to the

open air tiger and lion enclosure. Signboard indicates that there are five tigers and two Asian Lions in Mysore Zoo.

BRAZILIAN TAPIR: Circular open air enclosure, 450 ft in circumference. Grass substrate. Four water pools inside enclosure. Trees growing. One stone shelter, 10 ft x 8 ft x 6 ft. Dry moat in front of enclosure, 5 ft wide x 6 ft deep. Three animals observed, one "rushing" inside a 30 ft x 40 ft enclosed area. Signboard and barrier present.

ALBINO RHESUS MACAQUE: Circular cage, 75 ft in circumference and 20 ft high. Dry soil substrate. Two trees and one log inside cage. One shelter, 1.5 ft x 1.5 ft x 1.5 ft. Food and water inside cage. Two animals observed. Signboard and barrier present.

HAMADRYAS BABOON & MANDRILL: Circular open air enclosure, 170 ft in circumference. Dry soil mound in enclosure. Two large trees and two bamboo clumps inside. No water facility. Dry moat surrounding enclosure. One Hamadryas Baboon and one Mandrill observed. Signboard present saying only Mandrill. Barrier present.

GORILLA: Semicircular open air enclosure, with 210 ft perimeter. Grass substrate. Trees inside. Shelter attached. Electric fencing surrounding enclosure. One animal observed, a female specimen according to Zoo keepers. Animal observed eating. Signboard and barrier present.

CHIMPANZEE: Semi circular open air enclosure, 160 ft in perimeter. Grass substrate. Two trees inside, one live and one dead. 8 ft high wall surrounding enclosure with electric fencing on top. Two dens attached to enclosure. Two animals observed. Conversations with a keeper revealed there are seven animals. Signboard and barrier present.

WHITE RHINOCEROS: Open air enclosure, 150 ft x 120 ft. Dry soil substrate. Few grasses growing. Trees inside. Two water pools. One shelter, 10 ft x 8 ft x 8 ft. Dry moat surrounding enclosure. Two animals observed. Signboard and barrier present.

GRANT'S ZEBRA & FOUR HORNED ANTELOPE: Open air enclosure, 150 ft x 160 ft. Grass substrate. Trees inside and two water pools inside. One shelter, 10 ft x 8 ft x 8 ft. Dry moat surrounding enclosure. Two zebras and one Chowsinga (Four Horned Antelope) observed. Signboard only for zebra species. Barrier present.

LION TAILED MACAQUE: Circular open air enclosure, 200 ft in circumference with 9 ft high wall. Grass substrate. Trees and bamboo clumps. One shelter attached to wall at ground level. Two animals observed. Signboard and barrier present.

SLOTH BEAR: Open air enclosure, 40 ft x 40 ft. Soil substrate. Trees inside. Five attached dens, each 2 ft x 2 ft. One specimen observed. Signboard present.

MANED WOLF: Open air enclosure, 40 ft x 35 ft. Soil substrate with bushes and grass growing. Trees inside. Dens attached, but these dens have jackals. No food or water observed. One animal observed sleeping in front of den entrance. Signboard present in front of attached Jackal cages. Barrier present.

JACKAL: 8 ft x 6 ft x 8 ft cage attached to Maned Wolf enclosure. Cement floor and roof. Water bowl inside. No food noted. Strong odour emanating from cage. Two animals observed, one animal circling continuously. Wire netting in front of cage. Signboard says Maned Wolf. Barrier present.

JACKAL: 8 ft x 6 ft x 8 ft cage attached to Maned Wolf enclosure. Cement floor and roof. Water bowl inside. Strong odour emanating from cage. One animal observed. Wire netting in front of cage. No signboard but barrier present.

AXIS DEER: Open air enclosure, 300 ft x 150 ft, divided into two sections. Soil substrate, no grass growing at all. Few trees inside. One shelter, 12 ft x 8 ft x 8 ft. Food present in the form of browse but no water. Many animals observed, approximately one hundred individuals. Signboard and barrier present.

HOG DEER AND SWAMP DEER: Open air enclosure, 175 ft x 150 ft. Soil substrate, some bushes growing. Large trees inside enclosure. Browse present as food, but no water trough was observed. Twenty Swamp Deer and five Hog Deer were observed. Signboard only for Hog Deer. Barrier present.

SLOTH BEAR: 10 ft x 8 ft x 8 ft cage. Cement floor, walls and roof with barred front. No food but water reservoir. One animal showing an extremely high degree of stereotypic behaviour, variously bar biting, eating own spittle and self mutilating by biting limbs. Video footage taken of these actions. Signboard says MALAYAN SUN BEAR. Wire netting in front of cage. Barrier

present. Cage attached to open air enclosure, 50 ft x 40 ft. The open air enclosure had soil substrate with some bushes and bamboo growing inside. One dry water reservoir was observed in this enclosure. It is not known how often the bear is given access to the open air enclosure. The severe degree of stereotypy suggests that the animal is confined in the smaller cage most of the time. Barrier present in front of open air enclosure.

NEELGAI AND MUNTJAC DEER: Open air enclosure, 300 ft x 70 ft. Soil substrate and trees inside enclosure. One water pool. Four Neelgai antelope observed, two adults and two juveniles. Two Muntjac Deer inside enclosure. Signboard only for MUNTJAC DEER. Barrier present.

AFRICAN ELEPHANT: Circular open air enclosure, 650 ft in circumference. Soil substrate, grasses growing. Seven trees observed growing inside enclosure. Three water pools. One shed. Three animals, one adult male, one adult female and one young male. The adult male has a portion of his tusks sawn off. Animals observed eating and bathing. Signboard and barrier present. Animals observed reaching out to people by extending trunks. This is a potential hazard to visitors.

TIGER: Open air enclosure, 100 ft x 80 ft. Soil substrate with grasses. Trees growing. One water pool. Three dens attached to enclosure. Dry moat in front of enclosure, 12 ft wide x 15 ft deep. One animal observed pacing. Signboard and barrier present.

WHITE TIGER: Oval shaped open air enclosure, 350 ft perimeter. Soil substrate with grasses. Trees inside. One water pool with little water. Rocks inside enclosure. Three dens attached. Dry moat surrounding enclosure.

BLACK LEOPARD: 30 ft x 25 ft x 16 ft cage. Soil substrate. One tree and one log inside. Cage with double netting. Four attached dens. No food or water observed. Two leopards, one black and one normal coloured. Signboard and barrier present.

LEOPARD: 16 ft x 25 ft x 16 ft cage. Sloping cage with soil substrate. One log inside. One shelter, 8 ft x 8 ft x 8 ft. No food or water observed inside. Two juvenile animals in cage and one juvenile animal inside shelter. Signboard and barrier present.

LEOPARD: 35 ft x 35 ft x 16 ft cage. Soil substrate with scanty grass. Two large dead logs inside. Three dens attached to enclosure. Three animals observed, two animals performing stereotypies (pacing). No food and water inside cage. Signboard and barrier present.

ASIAN ELEPHANT: Circular open air enclosure, 650 ft in circumference. Soil substrate with grasses. Trees inside, some coconut bearing. Water pools present. Dry moat surrounding enclosure. Seven animals observed, three adults, three young and one tiny infant. Signboard and barrier present.

HIMALAYAN BLACK BEAR: Three cages, each 8 ft x 8 ft x 8 ft. Two bears in one cage and a single bear in the second cage, while the third cage was empty. Cages attached to open air enclosure with soil substrate and coconut trees. 500 ft perimeter and 8 ft surrounding wall. Two Axis Deer observed inside open air enclosure attached to cages holding Himalayan Black Bears. It is not known if the bears are released in the open air enclosure during the presence of the deer. Signboard says BROWN BEAR. Barrier present. Bear cages out of limits for the public.

AXIS DEER: Open air enclosure, 650 ft in circumference. Dry soil substrate with grass. Coconut trees inside. Dead logs strewn inside. One shelter attached, 20 ft x 15 ft x 15 ft. Dry moat surrounding enclosure. Eighty animals observed. Signboard and barrier present.

INDIAN RHINOCEROS: Open air enclosure, 400 ft in perimeter. Dry soil substrate with grasses and bushes. One big tree inside and one water pool. A single animal observed. Signboard and barrier present.

BROWN LEMUR: Circular cage, 50 ft in circumference and 12 ft high. Soil substrate. One log and nylon ropes inside. One small cement water reservoir. Two animals observed eating green vegetables. Signboard present but no barrier.

BINTURONG: Circular cage, 50 ft in circumference and 12 ft high. Soil substrate. Three trees inside. Small rock shelter, 2 ft x 1 ft x 2 ft. One small cement water reservoir inside. One animal observed sleeping. Signboard present but no barrier.

CHACMA BABOON: 10 ft x 10 ft x 8 ft cage. Cement floor, with plastic covering on roof. Food scattered on the floor. No water facility. One cement platform.

Three animals; two adults and one young. Signboard and barrier present.

HAMADRYAS BABOON: Three 8 ft x 8 ft x 8 ft cages. Cement floor and roof. Dry cement water reservoir. Cement platform. Six baboons observed, inclusive of two juveniles. Some of these animals lacked the distinctive mane of Hamadryas Baboons, so they might be young Chacma Baboons. Cages attached to open air enclosure, 200 ft in circumference. This open air enclosure is surrounded by electric fencing. Signboards and barrier present.

HIPPOPOTAMUS: Circular open air enclosure, 250 ft in circumference. Soil substrate and 12 ft x 10 ft water pool. Two trees and rocks inside. Enclosure surrounded by 6 ft high wall with 6 ft high fencing on top. Two animals observed. Attached shelter. Signboard and barrier present.

HIPPOPOTAMUS: Circular open air enclosure, 250 ft in circumference. Enclosure surrounded by 6 ft high wall with 6 ft high fencing on top. Cement substrate with rocks. One water pool, 8 ft x 16 ft. Water extremely dirty. Browse on the ground. Two animals observed eating. Signboard and barrier absent.

BLACK RHINOCEROS: Open air enclosure, 650 ft in perimeter. Grass substrate. Large number of bushes and trees inside. Two dry pools inside. Food and water troughs present. Dry moat surrounding enclosure. Two animals present. Barrier and signboard present.

COMMON MARMOSET: 15 ft x 15 ft x 10 ft cage with surrounding netting, 20 ft x 20 ft x 20 ft. Soil substrate. Some living plants and two logs inside. Two shelters, one large and one small. Hut type large shelter, 5.5 ft x 5.5 ft x 5.5 ft. Feeding platform inside hut shelter. Roof of cage covered with leaves and creepers. Small shelter, with a small round entrance hole, perched on top of a pole. Food on platform and water bowls. One rat observed eating animal's food. One marmoset observed, mostly running on the floor due to lack of branches inside cage. Signboard present with surrounding netting of cage serving as barrier.

STRIPED HYENA: Oval open air enclosure, 100 ft major axis x 8 ft high wire fencing. Grass substrate. Three cubicles attached each measuring approximately 7 ft x 7 ft x 8 ft. Cubicles have cement floor and roof. Water reservoir and tap inside one cubicle. Two animals in two

cubicles, while one cubicle was empty. One animal severely stereotyping (pacing). Signboard present but barrier only in front of cubicles. Signboard states diet of animal is 5 kilogram of beef daily.

BLACKBUCK: Open air enclosure, 95 ft x 40 ft. Sandy soil substrate. Trees inside. Food and water troughs present. Forty animals, including eight infants. Signboard present but no barrier.

BLACKBUCK: Open air enclosure, 120 ft x 40 ft. Sandy soil substrate. Trees inside. Food and water troughs present. Twenty eight animals. Signboard present but no barrier.

SLOTH BEAR: 8 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. One animal observed biting bars. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

SLOTH BEAR: 8 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. No animal observed. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

SLOTH BEAR: 8 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. One animal observed pacing and biting bars. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

SLOTH BEAR: 8 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. One animal observed biting limbs. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

SLOTH BEAR: 8 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. No animal observed. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

HIMALAYAN BLACK BEAR: 8 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. No animal observed. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

HIMALAYAN BLACK BEAR: 16 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. Two animals observed. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

HIMALAYAN BLACK BEAR: 16 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. Two

animals observed. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

HIMALAYAN BLACK BEAR: 8 ft x 8 ft x 8 ft cubicle. Cement floor and barred front. No food and water. No animal observed. Cubicle attached to 40 ft x 40 ft open air enclosure. Signboard absent, but barrier present.

WILD BOAR: Circular open air enclosure, 250 ft circumference. Grasses growing inside. No animal observed. Signboard present. Signboard gives the diet of the animal: Grass-2kg, carrot-600g, sugarcane-1kg, wheat bran-1kg, horse gram-500g, rice gram-2kg, nutritional cake-550g. No barrier.

NILGIRI LANGUR: Triangular cage, with sides of 12 ft. Cement substrate. Food observed but no water. Bread, cabbage and carrots provided as food. One iron bar inside. Five animals observed. Signboard absent, but barrier present.

SAMBAR: Open air enclosure, 80 ft x 40 ft with 7 ft high fencing. Grass substrate. Bamboo clumps and trees inside. One cement shelter with tiled roof, 7 ft x 10 ft x 8 ft. Three animals observed. Signboard and barrier absent.

SAMBAR: Circular open air enclosure, 450 ft in circumference. Mud substrate. Living trees. Tin plates hanging from a tree to provide shade for the animals. One dirty water pool. Grasses provided in trough. Thirty animals observed, including four fawns. Signboard and barrier present.

SAMBAR: Circular open air enclosure, 600 ft in circumference. Bamboo clumps inside. Tiled shelter. Dry moat surrounding enclosure. Three animals observed. No water inside. Signboard and barrier absent.

MITHUN: Open air enclosure, 60 ft x 40 ft. Mud substrate. Three large trees inside. One shelter (with tiled roof) measuring approximately 8 ft x 10 ft x 8 ft, situated inside enclosure. Ten animals observed; eight adults and two juveniles. No signboard and barrier in front of enclosure.

Birds

BUDGERIGAR: 3 ft x 2 ft pagoda-like cage. Two perches inside. Water bowl. Nesting pots. Five birds observed. One free living Five Striped Palm Squirrel observed in front of this cage. No signboard.

PEACH FACED LOVEBIRD: Octagonal cage, 90 ft in perimeter and 12 ft in height. Dry soil substrate. Water reservoir having dirty water. One log inside. Eight nesting pots observed. Two Peach Faced Lovebirds, two Cockatiels and three unidentified Dove species. Signboard absent but barrier in front of cage.

COCKATIEL: 10 ft x 6 ft x 4 ft cage. Cement substrate with some sand on the floor. Cage has wooden sides. One log, three nesting pots and one wooden shelter inside. Fifteen birds observed. Signboard present.

INDIAN PIED HORNBILL: 7 ft x 15 ft x 17 ft cage. Soil substrate and two trees inside. One dry water reservoir. One bamboo log and one shelter on the ground, 3 ft x 2 ft x 2 ft. Two birds observed. Signboard present but no barrier.

GREAT INDIAN HORNBILL: 35 ft x 15 ft x 18 ft cage. Hard, dry soil substrate and two trees inside. Bamboo logs as perches. Two water facilities, one empty. Three shelters on the ground, each 3 ft x 2 ft x 2 ft. Keeper observed cleaning cage. Two birds observed. Signboard present but no barrier.

EMU: 40 ft x 17 ft x 20 ft cage, divided into two sections. Hard, dry soil substrate. Five troughs and three trees. Two birds observed. No food or water. Signboard present but no barrier.

WHITE PEA FOWL: 60 ft x 20 ft x 20 ft cage, divided into three parts. Division wires jagged and rusting. Sandy soil substrate. Bamboo logs and small iron shelter. Empty food tray. Water facility. Palm plants in cage. Seven birds observed. One bird with feathers missing on head. Signboard present.

PEAFOWL: 10 ft x 18 ft x 12 ft cage. Hard, dry soil substrate. One log. One creeper growing on wire fencing. Dry water facility. One male bird in cage. Signboard absent, but barrier present.

PEAFOWL: 20 ft by 18 ft by 15 ft cage. Hard, dry soil substrate. One tree inside cage. Dry cement water trough.

No food inside cage. Bleaching powder inside cage. Four birds observed; two males and two females. Rat observed inside cage. No signboard but barrier present.

CAPE CROWNED CRANE: 14 ft x 15 ft x 10 ft cage. Thatched roof (wooden covering). Hard, dry soil substrate. Empty water facility and food tray. Bleaching powder inside. One bird present. No signboard, but barrier in front of cage.

EMPTY CAGE: 14 ft x 15 ft x 10 ft cage. Thatched roof (wooden covering). Hard, dry soil substrate. Empty water facility and food tray. No signboard but barrier in front of cage.

FLAMINGO: Cage measures approximately 12 ft x 18 ft x 10 ft. Soil substrate. Cement slab on floor. Shallow, dirty water on cage floor, 2 inches deep. Water tap turned on inside cage. Food tray present. Birds rummaging for food in water. Four flamingos and one red-wattled lapwing. Signboard present only for flamingo. No barrier.

BURMESE PEA FOWL AND INDIAN PEA FOWL: 55 ft x 18 ft x 18 ft cage divided into three parts. Division wires jagged and rusting. Sandy soil substrate. Food and water present. Two male Burmese Peafowl and thirteen Indian Peafowl (seven males and six females). One free Indian peacock observed on cage roof. Signboard for Burmese Peafowl only. No barrier.

ROSE RINGED PARAKEET & REEVES' PHEASANT: 11 ft x 20 ft x 18 ft cage. Part of cage has cement wall. Roof partially cemented. Substrate is part sandy soil and part cement. Plastic water tray and feeding tray present, but no food and water observed. One log and broken mud pots inside. Twelve Rose-Ringed Parakeets and one male Reeves' Pheasant. No signboard but barrier present.

GREY JUNGLE FOWL & ROSE RINGED PARAKEETS: 10 ft x 20 ft x 18 ft cage. Substrate part cement and part sandy soil. Two logs. Food scattered on the ground. Water pot. One Three Striped Palm Squirrel observed inside eating food on the ground. Two Grey Jungle Fowls, one male and one female. Eight Rose Ringed Parakeets. Signboard only for Grey Jungle Fowl. Barrier in front.

ROSE RINGED PARAKEET: 14 ft x 20 ft x 18 ft cage. Part of cage has cement wall and partially cemented roof. One bamboo perch and one log inside. One

wooden box. Tray with fruit, but food also strewn on cage floor. Cement water pool. Eighty birds observed. No signboard but barrier in front of cage.

KING VULTURE: 22 ft x 20 ft x 18 ft cage. Substrate partly cement, partly sandy. Two live plants and two logs. Metal perches inside. One bird observed. Signboard and barrier present.

AVIARY: Circular cage, 400 ft circumference. Soil substrate and profusely vegetated. Water pools inside. Five Black Swans, two Mute Swans, two Canada Geese and one Ruddy Shelduck. Signboards present.

BLACK KITE: Octagonal cage, 48 ft in perimeter and 12 ft high. Tiled roof. Gravel substrate. Bamboo perches. Empty food and water trays. Four birds. No signboard and barrier.

WALK THROUGH AVIARY: Large enclosure with profuse vegetation. Water pool and rocks. Bird species displayed include Lesser Adjutant Stork, Black-Necked Stork, Painted Stork, Spoonbill, Sarus Crane, Night Heron, Black Stork, Rosy Pelican, Pond Heron, White Ibis, Grey Pelican, White-Necked Stork. Visitors walk through enclosure via a bridge. Birds observed flying, preening and nesting. Signboards present but illegible due to bird droppings having leached the signboard surfaces.

Reptiles

INDIAN COBRA: Circular pit, 50 ft in circumference and 12 ft high. Sandy soil substrate. Water pool. One log and one cement pot inside. Sixteen snakes observed coiled around each other on the log. Three live rats observed, crawling over snakes. No barrier but signboard in front of cage.

WATER MONITOR: Circular pit, 75 ft in circumference with 5 ft wall and 5 ft high fencing on top of wall. Hard, dry sandy soil substrate. Logs and circular water pool, 4 ft in diameter. Rocks and two cement pot shelters. Living plants inside enclosure. Six animals observed; one large individual in water pool. Signboard and barrier absent.

GREEN IGUANA: Circular pit, 50 ft in circumference with 5 ft wall and 5 ft high fencing on top of wall. Soil substrate. Water pool and logs. Rocks and bricks inside cage. Rock slabs balanced to form shelter. Food tray

containing eggs and vegetables. Two reptiles observed. Signboard present but no barrier.

ESTUARINE CROCODILE: Circular pit, 150 ft in circumference. 4 ft high wall with 4 ft high fencing on top. Three trees. Semicircular water pool, 25 ft perimeter curve. One animal. Signboard and barrier present. Signboard says animal is fed 1.5 kilogram beef, twice weekly.

GHARIAL: Oval pit, situated inside the walk through aviary. 80 ft major axis. Soil substrate. Large water pool. Trees inside. Seven animals observed. Signboard and barrier present.

MARSH CROCODILE: Rectangular pit, 50 ft x 40 ft. Soil substrate with plants and rocks. Empty water pool. One reptile observed. Signboard and railing present.

AMERICAN ALLIGATOR: Pit, 130 ft x 35 ft. Soil substrate. 18 ft x 40 ft water pool. Bamboo clumps and plants. Twelve animals, one with open sore on top of upper jaw. Signboard and barrier present.

SPECTACLED CAIMAN: Pit, 60 ft x 35 ft. Pool in the figure of a quarter circle, 28 ft perimeter curve and sides of 22 ft and 18 ft. Soil substrate and bamboo clumps. Sixteen reptiles observed. Signboard absent, but railing present.

RAT SNAKE: Glass fronted cage with cement walls on three sides, 3.5 ft x 5 ft x 5 ft. Sand substrate. One water bowl. One log. Perforated mud pot with light inside. Two snakes. Barrier and signboard present.

RUSSELL'S VIPER: Glass fronted cage with cement walls on three sides, 3.5 ft x 5 ft x 5 ft. Sand substrate. One water bowl. One branch. Perforated mud pot with light inside. One snake observed. Barrier and signboard present. Signboard says snake fed one frog or rat per week.

RUSSELL'S VIPER: Glass fronted cage with cement walls on three sides, 3.5 ft x 5 ft x 5 ft. Sand substrate. One water bowl. One branch. Perforated mud pot with light inside. One snake observed. Barrier and signboard present. Signboard says snake fed one frog or rat per week.

KING COBRA: Advertised in front of Zoo entrance as '*NEW ATTRACTION: 11 FT LONG SNAKE AND WEIGHING 5.08 KILOGRAMS*'. Glass fronted cage with three cement walls, 10 ft x 10 ft x 10 ft. Wire roof. Water pool. Two perforated pots. Sand substrate.

One palm plant and one log. One snake observed inside 2 ft x 1 ft wooden box with wire top and small entrance hole. Signboard and barrier present.

KING COBRA: Oval glass fronted enclosure with cement sides, 40 ft major axis. Wire roof and metal framework on roof. Soil substrate. Perforated pots. Water pool. Rock slabs. Plants inside. No snake observed. Signboard and barrier present. Signboard says diet of snake is one rat snake per week.

RETICULATED PYTHON: Glass fronted cage with cement sides, 8 ft x 8 ft x 8 ft. Wire roof. Sand substrate. Two perforated pots. Water pool. One log. Rock slabs balanced as shelter. No snake observed. Signboard and barrier present. Signboard says snake fed on one chicken per week.

ROCK PYTHON: Glass fronted cage with cement sides, 8 ft x 8 ft x 8 ft. Wire roof. Sand substrate. Two perforated pots. Water pool. One log framework. Rock slabs balanced as shelter. One snake observed. Signboard and barrier present. Signboard says snake fed one chicken per week.

ROCK PYTHON: Glass fronted cage with cement sides, 8 ft x 8 ft x 8 ft. Wire roof. Sand substrate. One perforated pot. Water pool. One log framework. Rock slabs balanced as shelter but not enough space to accommodate snake. One snake observed. No signboard but barrier present. Signboard says snake fed on one chicken per week.

STARRED TORTOISE: Glass fronted cage with cement sides, 8 ft x 8 ft x 8 ft. Sand substrate. Two perforated pots. Water pool. Five animals present. Carrots and vegetables provided as food. No signboard but barrier present.

COMMENTARY

Mysore Zoo is a traditional Zoo. Hardly surprising, considering it was started during the last century. A variety of cage and enclosure designs can be found, including open air paddocks (e.g., white rhino, black rhino) and bar and concrete cages. The Zoo has made an effort to improve some of the old menagerie-style cages. However, some glaring shortfalls are still apparent.

The presence of the single gorilla is particularly disconcerting. Under no circumstances should gorillas be housed alone. A Common Marmoset was also housed

alone. Many of the other primates were kept in cages that do not measure up to modern Zoo standards.

As well, a gaur was observed exhibiting stereotypic behaviour and a number of carnivores were also observed behaving abnormally. Some cages (e.g., mongoose) were devoid of environmental enrichment.

The Zoo seems to have collected as many species as possible for display and the majority of the herbivore enclosures are overcrowded. The Rose Ringed Parakeets were also overcrowded.

Most enclosures have signboards but they are clearly not providing much more information than the ubiquitous species name and distribution. The Zoo produces a guidebook that provides basic information about the facility. There was no information however on what role, if any, the Zoo plays in recognized captive propagation or reIntroduction programs. Overall, there do seem to be some educational opportunities for schoolchildren. The Zoo does seem to have at least some potential to develop into a meaningful education center provided it changes some aspects of its management and policies (e.g., animal acquisition).

Unfortunately, this Zoo appears to pay little regard to genuine conservation goals. While the Zoo has had some involvement in conducting theoretical conservation exercises like a Population and Habitat Viability Analysis (PHVA) for Sangai Deer, there is little evidence of any real involvement in more practical conservation initiatives.

The grounds are clean and generally well maintained.

RECOMMENDATIONS

1. The Zoo should gradually downsize its animal collection and focus primarily on animal species that can be accommodated more appropriately and that are more suitable for conservation and education purposes.
2. The Zoo should control the overpopulation of herbivores by stopping further breeding and relocating existing surplus to other suitable facilities.
3. The breeding of chimpanzees and baboons should be stopped immediately.
4. The gorilla should be moved to more socially appropriate accommodation elsewhere as soon as possible.

5. All other single animals, such as the Chowsinga (Four Horned Antelope) and Common Marmoset, should be provided with companions or moved to another facility with more appropriate social conditions.
6. The mongoose cage needs to be rearranged and properly equipped. The primate house needs to be overhauled or removed to make way for a new, more modern enclosure.
7. Carnivore cages need enrichment. The bears should be given permanent access to their open air enclosures.
8. A program of environmental enrichment should be initiated for all animals in the Zoo and be provided with meaningful support by Zoo management.
9. In front of mixed species exhibits, signboards should be present for all the species displayed and should explain why these species are kept together.
10. Educational efforts (e.g., signboards) should focus on biology, behaviour, conservation and animal welfare and should not be restricted to the rather meaningless
11. The crocodile pits have railings just above the enclosures. This is potentially lethal as a baby could fall off from above and be mauled or killed. There should be another barrier set back from the present one.
12. The barriers in front of the African elephant enclosure need to be set back so the elephants remain physically out of reach of the visitors.

TRICHUR ZOO

Trichur, Kerala—August 15-16, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- WILD BOAR:** 35 ft x 25 ft paddock. Cement substrate. 3 ft x 4 ft water pool. Tap inside. One shelter attached. No food observed in enclosure. Three animals observed. Signboard, but no barrier.
- LION TAILED MACAQUE:** 8 ft x 12 ft x 8 ft cage. Cement substrate. Cement roof. Log. Water reservoir measuring 1.5 ft x 1.5 ft with 2 inches deep water. Food strewn on the ground. One animal observed. Signboard and barrier observed.
- HIMALAYAN BLACK BEAR:** Circular open air enclosure, 250 ft in circumference. Soil substrate with grass. Small trees. Dry moat surrounding land area, 6 ft in width. 14 ft high wall in front of moat. Two attached dens with cement floor and roof, each 10 ft x 8 ft x 10 ft. No food or water observed in enclosure or den. One animal observed panting in extreme heat. Signboard and barrier present.
- PORCUPINE:** 30 ft x 25 ft paddock. Soil substrate. Two trees. One shelter with cement floor and asbestos roof: 6 ft x 1 ft x 1.5 ft shelter. One cement water facility: 1 ft x 1.5 ft with 2 inches deep water. No food observed. Two animals observed. Signboard present but no barrier.
- SAMBAR:** 90 ft x 200 ft paddock. Mud substrate. Trees inside. Dry moat, 5 ft wide and 6 ft high wall in front of moat. One shelter with cement floor and asbestos roof, 15 ft x 20 ft x 12 ft. 2 ft x 12 ft cement platform for food. Food present. No water. Thirty animals observed. Signboard and barrier present.
- HIPPOPOTAMUS:** 120 ft x 55 ft paddock. Soil substrate with grasses. Circular water pool, 20 ft in diameter.
- Trees. Food trough. Two animals observed. Signboard and barrier present.
- AXIS DEER:** 160 ft x 65 ft paddock. Mud substrate. Two attached shelters with cement floors and asbestos roofs, 20 ft x 7 ft x 12 ft and 20 ft x 18 ft x 12 ft. One dry pool, 1 ft x 7 ft. Food trough. Over 150 animals observed. Signboard and barrier present.
- CAMEL:** 25 ft x 65 ft paddock. Soil substrate. One water pool, 1 ft x 4.5 ft. One shelter, 6 ft x 15 ft x 12 ft. One animal observed harassed by crows. Signboard and barrier present.
- LION:** 15 ft x 10 ft x 8 ft cage. Walled sides and barred front. Cement substrate. Empty food and water troughs, measuring 1.5 ft x 1.5 ft. Cage extremely dark. No food or water present. One male animal observed. Signboard and barrier present.
- LIONESS:** Elliptical cage, major axis 18 ft and 10 ft high. Cement floor. Roof having tiles on top of fencing. Water reservoir, 2 ft x 2 ft. Meat strewn on the ground. One lioness observed. Signboard and barrier present.
- LEOPARD:** Elliptical cage, 18 ft major axis and 10 ft high. Cement floor and fenced roof with tile covering. Meat strewn on the ground. No water inside. One animal observed pacing. Signboard and barrier present.
- BLACK PANTHER:** Elliptical cage, 18 ft major axis and 10 ft high. Cement floor and fenced roof with tile covering. Meat strewn on the ground. No water inside. One animal observed pacing. Signboard and barrier present.
- BONNET MACAQUE:** 8 ft x 10 ft x 8 ft cage. Cement floor and cement roof. 1 ft x 1 ft water reservoir with little water. Food on the ground. One animal observed. Signboard and barrier present.

BONNET MACAQUE: 8 ft x 10 ft x 8 ft cage. Cement floor and cement roof. 1 ft x 1 ft water reservoir with little water. Food on the ground. One animal observed. Signboard and barrier present.

BONNET MACAQUE: 10 ft x 15 ft x 12 ft cage. Cement floor and asbestos roof. Cement platforms. One log. Two water reservoirs, each 1 ft x 1 ft with 2 inches deep water in both. No food. Twenty three animals observed; thirteen adults and ten juveniles. Signboard and barrier present.

RHESUS MACAQUE: 10 ft x 15 ft x 12 ft cage. Cement floor and asbestos roof. Cement platforms. One log. Water reservoir, 1 ft x 1 ft with 2 inches deep water. No food. Fifteen animals observed, including six juveniles. Signboard and barrier present.

Birds

PAINTED STORK: 15 ft x 10 ft x 20 ft cage. Sand substrate. Circular water reservoir, 5 ft in diameter. One perch, one log and one tree in cage. Shelter, 6 ft x 12 ft x 3 ft. One bird observed. Signboard and barrier present.

OWLS & KITES: 50 ft x 15 ft x 20 ft cage. Roof partially covered by tin. Two cement water reservoirs. Three shelters, each 6 ft x 12 ft x 3 ft. Perches. Jagged wire division inside cage. Vegetation and logs present. Eight Brown Fish owls, one Brahminy Kite and two Black Kites observed. Signboards for all species and barrier present.

ROSY PELICAN: Elliptical cage, 60 ft major axis. Soil substrate. Trees. Two water reservoirs. One Rosy Pelican observed with toes and web of right foot missing. One cormorant also in cage. Signboard present but no barrier.

BARN OWL: 12 ft x 20 ft x 8 ft cage. Cement floor and wire roof. Logs. One water reservoir, 1 ft x 1.5 ft. Five birds observed. Signboard present, but no barrier.

MIXED SPECIES AVIARY: 18 ft x 35 ft x 20 ft cage. Soil substrate with grass. Logs. Cement water pool with 6 inches of filthy water, 8 ft x 8 ft. Birds observed include one Night Heron, one White Stork, one Adjutant Stork and one Darter. Signboard and barrier present.

Reptiles

SALTWATER CROCODILE: 20 ft x 50 ft pond with basking area. Dry area has soil substrate and grass. 15 ft high wall surrounding enclosure. Green algae filled water in pond. Two reptiles observed eating live fish. Signboard and barrier present.

GHARIAL: Circular pit, 25 ft in diameter. 75% of the pit consists of a pool. Dry area has soil substrate with grasses and two trees. Live frogs inside. Three animals observed. Signboard and barrier present.

TRAVANCORE TORTOISE: 3.5 ft x 7 ft x 4 ft cage. Cement floor and cement roof. Water reservoir, 1 ft x 1.5 ft. Food strewn around the floor. One animal observed. Signboard and barrier present.

ROCK PYTHON: 6 ft x 9 ft x 8 ft cage. Wire roof. White sand substrate. Logs. Potted plant. One heart shaped water reservoir with 2 inches deep water. One live chicken inside. One snake observed. No signboard and barrier present.

RUSSELL'S VIPER: 1.5 ft x 3.5 ft x 4 ft glass fronted cage. Sand substrate. Circular water bowl, 6 inches in diameter. No food inside. One snake observed. Signboard and barrier present.

INDIAN COBRA: 2.5 ft x 3.5 ft x 4 ft glass fronted enclosure. Wire roof. Log. One circular water bowl, 6 inches in diameter. One dead rat observed. One snake observed. Signboard and barrier.

CHAMELEON: 2.5 ft x 2 ft x 4 ft glass fronted cage. Wire roof. Sand substrate. Potted plant. Circular water bowl, 6 inches in diameter. Log. Two animals observed. One animal appeared to be trying to escape by gnawing a dent in the wooden portion of the cage. Signboard and barrier present.

COBRA: 3.5 ft x 3.5 ft x 4 ft glass fronted cage. Wire roof. Sand substrate. Stones. One circular water pot, 6 inches in diameter. Two wooden platforms. One snake observed. Signboard and barrier present.

RUSSELL'S VIPER: 2.5 ft x 2 ft x 4 ft glass fronted cage with sand substrate and wire roof. One circular water pot, 6 inches in diameter. One snake observed. Signboard and barrier present.

COMMENTARY, CONCLUSIONS AND RECOMMENDATIONS

Trichur Zoo is an old facility and is situated adjacent to a museum. It is operated by the same governing council which oversees the affairs of the museum.

Virtually all of the animal enclosures at Trichur Zoo are inadequate and there is little evidence of modern Zoo practices. Cages are dilapidated, dirty and overcrowded. Many animals are exhibiting stereotypic behaviours. Single animals abound and the general layout is improper for a modern Zoo. This facility has no legitimate education or conservation value.

Since the changes that are needed are substantial and it is unlikely they will ever occur, this Zoo should be phased out. All breeding must cease and animals currently living at the facility should be placed in more suitable accommodation elsewhere.

TRIVANDRUM ZOO

Trivandrum, Kerala—September 3 - 4, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- LION TAILED MACAQUE:** 70 ft x 45 ft open air enclosure. Soil substrate. Grasses and trees. Mounds inside enclosure. Water reservoir. Moat in front of enclosure. 8 ft high cement wall surrounding rest of enclosure. Attached den, 25 ft x 8 ft x 10 ft. Five animals observed. Signboard and barrier present. Animals were given food x the public. Enclosure inaugurated on 21st August, 2001.
- COMMON LANGUR:** 2 cages, each measuring 12 ft x 18 ft x 15 ft. Floor having two layers; cement substrate. One log. One iron swing. Circular water reservoir, 1.5 ft in diameter. No food observed. Keeper observed cleaning the cage. Three animals observed, two in one cage and a single animal in another cage. Signboard and barrier present.
- BROWN CAPUCHIN MONKEY:** 12 ft x 18 ft x 15 ft cage. Floor having two layers; cement substrate. Cage having a platform. One tyre for hanging. Circular water reservoir, 1.5 ft in diameter and having 2 inches deep water. No food observed. Two animals observed, one of them continuously pacing on the platform. The other animal was pacing on the floor. Signboard and barrier present.
- NILGIRI LANGUR:** 12 ft x 18 ft x 15 ft cage. Floor having two layers; cement substrate. Cage having two platforms on the wall. Circular water reservoir, 1.5 ft in diameter and having 2 inches deep water. One log. No food observed. One animal observed. Signboard and barrier present.
- HIMALAYAN BLACK BEAR:** Open air enclosure having sides, 30 ft, 45 ft, 40 ft and 45 ft. 10 ft high wall on one side. Two sides having 5 ft high walls and 5 ft high fencing on top of walls. Another side partly taken up by two dens, each measuring 8 ft x 5 ft x 8 ft. Soil substrate with scanty grass. Three trees. One triangular water pool with sides, 15 ft, 15 ft and 8 ft. One log. No food observed in enclosure or den. One animal observed. No signboard and barrier present.
- SLOTH BEAR:** 65 ft x 60 ft open air enclosure. Soil substrate with grass. Tin plates attached to fencing to prevent animals from climbing. Sloping enclosure. Two stone caves, each measuring 4 ft x 5 ft x 2 ft. One dry pool. One attached den, 6 ft x 6 ft x 6 ft. No food or water observed in cage or den. Two animals observed inside den, both stereotyping (swaying). Signboard and barrier present.
- GIRAFFE:** Paddock consisting of two parts. One part is 60 ft x 75 ft. Soil substrate with grass. Four trees. One shelter with tiled roof. No water facility observed. One animal observed in this part of the enclosure. Second part of the enclosure is 120 ft x 55 ft. Soil substrate with grass. No trees. One shelter with tiled roof, 30 ft x 30 ft x 20 ft. One juvenile observed. Signboard and barrier present.
- LION:** Elliptical cage, 70 ft perimeter. Cement floor. One log inside. 1 ft x 1 ft water reservoir. One attached den, 10 ft on one side and having 2 ft x 2 ft entrance. The length of the other side of the den could not be ascertained. The door of the den was closed to shut out the animal in the cage. Meat scattered on the floor. One male animal observed, pacing continuously. Signboard and barrier present.
- TIGER:** Elliptical cage, 70 ft perimeter. Cement floor. One log inside. 1 ft x 1 ft water reservoir. One attached den, 10 ft on one side and having 2 ft x 2 ft entrance. The length of the other side of the den could not be ascertained. The door of the den was closed to shut out one animal in the cage. Meat scattered on the floor. Two

animals observed; one in den and one in cage. Both animals pacing. Signboard and barrier present.

LEOPARD: Elliptical cage, 70 ft perimeter. Cement floor. One log inside. One attached den, 10 ft on one side and having 2 ft x 2 ft entrance. The length of the other side of the den could not be ascertained. The door of the den was closed to shut out the animals in the cage. No food and water observed. Two animals observed in cage. Signboard and barrier present.

LIONESS: 10 ft x 10 ft x 10 ft cage. Cement floor. Meat inside. Water in a metal tray. One animal observed. Animal seemed extremely sick with matted hair and glazed eyes. No signboard but barrier present.

WILD BOAR: 30 ft x 20 ft paddock. Mud substrate. 10 ft x 8 ft x 8 ft shelter. One water reservoir, 2.5 ft x 2.5 ft with 6 inches deep water. Tap inside. No food observed. Two animals observed, one with gaping hole on the back. Signboard and barrier present.

TIGER: Circular open air enclosure, 350 ft in circumference. Sloping enclosure. The upper part of the enclosure has soil substrate with grasses and five trees. The lower part is cemented. One water pool. No food observed in enclosure. One animal observed in water pool. Signboard and barrier present.

INDIAN RHINOCEROS: Paddock, 750 ft in perimeter. Soil substrate with grasses. Coconut trees. One water pool, 20 ft x 10 ft. Moat surrounding land area, 6 ft wide. 8 ft wide high wall surrounding moat. One attached den. Food inside enclosure. One animal observed eating. Signboard and barrier present.

HIPPOPOTAMUS: Paddock, 350 ft perimeter. Sloping enclosure with part soil and part cement substrate. 50 ft x 10 ft water pool. Trees. One attached shelter with cement floor and cement roof, 10 ft x 8 ft x 8 ft. No food observed. Three animals observed, including one juvenile. Signboard and barrier present.

AFRICAN CAPE BUFFALO: 80 ft x 60 ft paddock. Soil substrate with grasses. Trees. One circular cement pool, dry, 12 ft in diameter. One attached shelter with cement floor and roof. Dry moat surrounding land area, 6 ft in width. 7 ft high wall in front of moat. No water inside enclosure or moat. Three animals observed, including one juvenile. Signboard and barrier present.

NILGIRI TAHR: 50 ft x 50 ft paddock. Sloping enclosure with soil substrate. One tree. Part of enclosure rocky. One water reservoir, 1.5 ft x 1.5 ft. One cement platform on ground for food presentation. One shelter with cement floor and tiled roof, 8 ft x 8 ft x 10 ft. 7 ft high wall surrounding land. One animal observed. Signboard present, but no barrier.

SMALL TRAVANCORE FLYING SQUIRREL: 12 ft x 12 ft x 7 ft cage. Cement floor with asbestos roof. Two shelters. Two pots. Logs. Metal rod inside. No food or water observed. One animal observed. Signboard and barrier present.

Birds

COCKATOO: 12 ft x 12 ft x 15 ft cage. Sand substrate. Wooden roof. Water reservoir, 1.5 ft x 1.5 ft with 2 inches deep water. One wooden platform on the wall, 1.5 ft x 6 ft. Metal perch. One cement and stone shelter, 2 ft x 2 ft x 2 ft. No food observed. Two birds observed. Signboard and barrier present.

KING VULTURE: Octagonal cage having sides of 7 ft and 12 ft high. White sand substrate. Cement roof. Bamboo and metal perch. One tyre. Two cement shelters. No food or water observed. Two birds observed. Signboard and barrier present.

GREY HERON: Triangular cage, equilateral, sides 18 ft. 20 ft high. Soil substrate. Log and perch. One small tree. One empty food pot. One circular water reservoir, 8 inches in diameter. 3 ft x 14 ft pond having shallow water. Tap inside pond. Three birds observed. Signboard and barrier present.

Reptiles

GHARIAL: Triangular open air enclosure, equilateral, sides of 55 ft. 7 ft high fencing. Triangular water pool. Cement basking area having sand. Trees. Five reptiles observed. Free living Night Herons and Little Egrets inside cage. Signboard present but no barrier.

COBRA: 3 ft x 2.5 ft x 2.5 ft glass fronted enclosure. Fencing forming roof and back of the enclosure. Two sides of enclosure made of wood. Sand substrate. One water pot. One tree in a tub. One snake observed. Signboard and barrier present.

RUSSELL'S VIPER: 1.5 ft x 2.5 ft x 2.5 ft glass fronted enclosure. Fencing forming roof and back of the enclosure. Two sides of enclosure made of wood. No food or water observed. One snake observed. No signboard but barrier present.

RUSSELL'S VIPER: 4 ft x 2.5 ft x 2.5 ft glass fronted enclosure. Three sides of enclosure made of wood. Wire roof. Sand substrate. Rocks. Barren enclosure except for a single branch. Water bowl. Two live rats observed inside enclosure. Two snakes observed. Signboard and barrier present.

GOLDEN TREE SNAKE: 2 ft x 2 ft x 2 ft glass fronted enclosure. Three sides of enclosure wooden. Gravel substrate. Rocks, branches, potted plant and water bowl. No food observed. One snake observed. Signboard and barrier present.

ROCK PYTHON: 8 ft x 4 ft x 4 ft wire cage. Sand substrate. Water reservoir, 1 ft x 4 ft with 4 inches deep water. No food observed, dead or alive. Two snakes observed. Signboard and barrier present.

BENGAL MONITOR: Triangular wire cage, sides, 10 ft, 6 ft and 6 ft and 5 ft high. Cage divided in two parts. Gravel substrate. One rock. Logs and branches. One empty trough. Two water pots, one mud and one aluminum. No food observed. One animal observed clinging to wire. Signboard present but no barrier.

GREEN TREE SNAKE: 3.5 ft x 3.5 ft x 2.5 ft glass fronted enclosure with wooden sides. Sand substrate. Potted plant. Rocks. One snake observed on potted plant. Signboard and barrier present.

COMMENTARY

Trivandrum Zoo gives the impression of a Victorian era menagerie. In fact, it is the oldest government-run Zoo in India. Most of the enclosures are relics of a bygone era. This is the Zoo which served as a resource for Yan Martel's popular novel *The Life of Pi*.

Animal husbandry practices appear basic and inadequate. Whatever changes were in evidence seem to be aesthetically-based and not connected with improvements in animal welfare. Abnormal behaviours, including stereotypies, are common. The reptile house is appalling and seems like a ghetto-museum.

Educational efforts are limited to signboards only and on many exhibits they are missing. Improvements can only be limited in the present location of the Zoo in the centre of the city. It's doubtful this Zoo could make any legitimate contribution to wildlife conservation.

Size: Undersized and generally inadequate.

Substrate: Mainly cement.

Furnishings/Enrichment: Primitive or absent. Ineffectual.

Educational Graphics: Basic or absent.

Safety: Adequate

RECOMMENDATIONS

1. Trivandrum Zoo should immediately stop breeding all animals, especially big cats and Axis Deer.
2. Old-style cages should be phased out to make way for open-air enclosures.
3. Small animal cages (e.g., wild cats, flying squirrels) need to be replaced. Until they are, existing cages should be improved and properly equipped.
4. All primate cages should be properly equipped.
5. An institution-wide program of environmental enrichment should be developed and implemented as a way of improving animal welfare.
6. The elephant and the rhino should be moved to more appropriate accommodation in another facility.
7. Cement substrates should be replaced with natural, soft substrates.
8. All social animals should be provided with appropriate social environments.
9. Veterinary attention should be more vigilant and effective as some animals appeared ill, while others had open wounds (e.g. wild boar).

VAN VIHAR NATIONAL PARK AND ZOO

Bhopal, Madhya Pradesh—May 10 - 11 & 13, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- STRIPED HYENA:** 150 ft x 250 ft open air enclosure with 6 ft high fencing. Soil substrate with dry leaves, rocks and bamboo. Water facility. One animal observed. No barrier but signboard present.
- LION:** 95 ft x 40 ft open air enclosure. Dry soil substrate with rocks. Sloping enclosure with trees and surrounding wire fencing 12 ft high. The fencing is hot-wired. Attached cement den, 8 ft x 7 ft x 7 ft. One male animal observed. Animal seemed sick and was observed limping. No food or water observed in enclosure. Barrier and signboard present.
- LION:** Very large open air enclosure; dimensions difficult to estimate. At least 200 ft long on one side. Dry soil substrate with rocks. Trees and vegetation inside. Attached dens. 12 ft high wall in front of enclosure. No animals observed. Signboard and barrier present.
- LEOPARD:** 40 ft x 10 ft x 10 ft cage. Thatched roof. Dry soil substrate. Logs inside. Water facility. Cage connects to large open air enclosure. Two animals observed pacing. Signboard and barrier present.
- LEOPARD:** Very large open air enclosure, dimensions difficult to estimate. At least 200 ft long on one side. Dry soil substrate with rocks. Trees and vegetation inside. Attached cage with a narrow passage serving as the connection. 12 ft high wall in front of enclosure. One animal observed. Signboard and barrier present.
- TIGER:** Very large open air enclosure, dimensions difficult to estimate. At least 180 ft long on one side. Dry soil substrate with rocks. Trees and vegetation inside. 12 ft high wall in front of enclosure. Pond inside enclosure. No animals observed. Signboard and barrier present.
- WHITE TIGER:** Very large open air enclosure, dimensions difficult to estimate. At least 240 ft long on one side. Dry soil substrate with rocks. Trees and vegetation inside. 12 ft high wall in front of enclosure. Pond inside enclosure. No animals observed. Signboard and barrier present.
- TIGER CUBS:** 30 ft x 70 ft open air enclosure. Soil substrate with grass. One tree and logs inside. Pond and attached den. Three cubs observed. No signboard but barrier present.
- SLOTH BEAR:** Very large open air enclosure, dimensions difficult to estimate. At least 200 ft long on one side. Dry soil substrate with rocks. Trees and vegetation inside. 12 ft high wall in front of enclosure. No animals observed. Signboard and barrier present.
- ALBINO SLOTH BEAR:** Oval shaped open air enclosure, 180 ft major axis. Rock substrate. Sloping enclosure; basically barren. Attached shelter and water facility. One stereotyping (swaying) animal observed. Signboard and barrier present. Signboard indicates this animal was obtained from Bilaspur in Madhya Pradesh.
- BLACKBUCK:** Triangular paddock with sides of 60 ft, 40 ft and 25 ft. Soil substrate with rocks and trees. Thatched shelter attached to enclosure. Metal water pot. Food observed inside enclosure in the form of hay and fresh grass. Three animals observed. Signboard and barrier present.
- CHOWSINGA:** 20 ft x 30 ft enclosure. Soil substrate with rocks and trees. Thatched shelter attached to enclosure. Metal water pot. Food observed inside enclosure in the form of hay and fresh grass. Three animals observed. Signboard and barrier present.

CHINKARA: 25 ft x 25 ft enclosure. Soil substrate with rocks and trees. Thatched shelter attached to enclosure. Metal water pot. Food observed inside enclosure in the form of hay and fresh grass. Three animals observed. Signboard and barrier present.

COMMENTARY

Van Vihar Zoo is part of a national park so it seems unnecessary to have to confine animals for public display, especially in a fabulous tract of natural, deciduous forest.

Marsh crocodiles (not mentioned previously) were kept in a very large enclosure for which the proper boundaries could not be ascertained. Many of the other enclosures were also very large.

Sambar and Axis deer were observed inside the Marsh crocodile enclosure (which also houses gharials). It appeared to be a potentially hazardous situation and it is not known whether this arrangement is intentional. The signboards indicate that the crocodiles are fed meat and fish, so one assumes that live deer are not part of their regular diet.

Stereotypic behaviours (e.g., pacing, swaying) were observed in the leopards and the albino Sloth bear. A lion appeared ill and was limping.

Size: Enclosures are sizeable. This Zoo appears to be the only Indian Zoo where leopards are exhibited in open air enclosures. However, large size has failed to prevent the development of stereotypic behaviour in several of the carnivores, an illustration of just how problematic captivity can be for animals.

Substrate: Natural earth.

Furnishings/Enrichment: Not required in most cases, although enrichment should be considered for the leopards and the Sloth bear.

Educational Graphics: For the most part, exhibit graphics were basic.

Safety: Generally acceptable.

CONCLUSIONS AND RECOMMENDATIONS

The presence of captive animals in Van Vihar National Park is unnecessary. Visitors have ample opportunity to view native birds and other wildlife without having to look at animals in cages, even if they are very large cages.

This Zoo should switch to housing rescued animals or phase itself out.

VEERMATA JIJABAI UDYAN ZOO

Bombay, Maharashtra—November 14 - 15, 2002

ANIMAL HOUSING AND HUSBANDRY

Mammals

- ASIATIC LION: Open air enclosure, 18 ft x 40 ft x 15 ft high. Soil substrate. Attached den. No food observed. Water trough present. One animal observed. Barrier present but no signboard.
- ASIATIC ELEPHANT: 80 ft x 140 ft paddock. 6 ft wide moat in front. Soil substrate with scanty grass. Dry pool 25 ft x 35 ft. Attached sheds, each one 10 ft x 8 ft x 14 ft. No food observed in enclosure. Mahout observed with sharp ankus or bullhook. Four animals observed, one chained inside a shed. No signboard but barrier present.
- BONNET MACAQUE: 25 ft x 25 ft x 20 ft cage. Soil substrate. Attached shelter. One tire and one swing. Two logs. No food or water observed. Five specimens noticed. Signboard and barrier present.
- LEOPARD: 30 ft x 45 ft x 14 ft cage. Soil substrate. Bamboo clumps inside. Logs. Small plants. Attached den. No food or water observed. One animal observed pacing. Signboard and barrier present.
- LEOPARD: 25 ft x 25 ft x 8 ft cage. Sand and cement substrate. Logs. Tiny water reservoir. Attached shelter, 7 ft x 20 ft x 10 ft. No food observed. One animal observed with blackened eye. Signboard and barrier present.
- HIMALAYAN BLACK BEAR: 60 ft x 60 ft open air enclosure with 8 ft wide moat. Soil substrate. Grass and plants. Rock construction in front, 25 ft high with numerous holes. Fencing in front on rock construction with barbed wire and spikes. No food observed. Two animals observed. Signboard and barrier present.
- ASIATIC LION: Open air enclosure, 65 ft x 80 ft and 20 ft high. Soil substrate. Plants. Dry pool. Two attached shelters. One with sand substrate and tin roof, 30 ft x 18 ft x 10 ft. Another with cement substrate, 25 ft x 12 ft x 10 ft. No food observed. Two animals observed, one male and one female. People observed disturbing animals. Signboard and barrier present.
- TIGER: 70 ft x 45 ft open air enclosure with 20 ft high fencing. Soil substrate. Thickly vegetated. Three shelters, each, 25 ft x 25 ft x 16 ft. Three kraals, each measuring 10 ft x 10 ft x 7 ft. Three animals observed, all pacing. Signboard and barrier present.
- CHOWSINGA: 35 ft x 25 ft paddock, divided into four parts. Soil substrate with grass. Seven animals observed. No water in enclosure. Signboard and barrier absent.
- SARUS CRANE: 20 ft x 40 ft paddock. Soil substrate. Rusting fencing. Cage extremely dirty with feces all over. No food or water observed. Two Sarus Cranes and two Adjutant Storks observed. No signboard and barrier present.
- BLACKBUCK: 160 ft x 400 ft paddock. Soil substrate. Barren enclosure. Shed inside. Food trough observed but no water facility. Forty five animals observed. No signboard and barrier. People feeding and poking animals in the absence of a barrier.
- STRIPED HYENA: 20 ft x 35 ft x 8 ft cage. Soil substrate. Couple of trees. Water pot. Attached shelter with cement substrate, 20 ft x 10 ft x 14 ft. Rock cave inside shelter. Signboard in Hindi. Barrier present.
- PORCUPINE: 18 ft x 12 ft x 12 ft cage. Cement substrate. Rock cave inside cage. One log. Food strewn on the ground. No water. Two animals observed, one albino specimen. Signboard and barrier present.

INDIAN RHINO: 130 ft x 65 ft paddock. Soil substrate. 10 ft x 20 ft water pool. Browse observed in enclosure. One animal observed. Signboard and barrier present.

HIPPOPOTAMUS: 130 ft x 65 ft paddock. Soil substrate. 15 ft x 20 ft water pool. No food observed. Two animals observed in water. Signboard and barrier present.

SAMBAR AND GHARIAL: Oval island 60 ft major axis. Oval shaped water reservoir, 200 ft major axis. Water hyacinth growing on the surface of the pond. Five Sambar and free living Painted Storks and Little Egrets living on the island. Three Gharials observed in the water. Signboard for Gharial only. Barrier present.

Birds

PIED HORNBILL: 12 ft x 15 ft x 15 ft glass fronted cage. Wire roof. Wall on one side. Soil and cement substrate. Potted plant and logs. Wooden box. Metal perch. Food in cement trough. Two birds observed. Signboard and barrier present.

AFRICAN GREY PARROT: 12 ft x 15 ft x 15 ft glass fronted cage. Wire roof. Wall on one side. Soil and cement substrate. Potted plant and logs. Four wooden boxes. Metal perch. Food in cement trough. Sixteen birds observed. Signboard and barrier present.

HILL MYNA: 12 ft x 15 ft x 15 ft glass fronted cage. Wire roof. Wall on one side. Soil and cement substrate. Potted plant and logs. Metal perch. Food in cement trough. Sixteen birds observed. No signboard but barrier present.

MILITARY MACAW: 12 ft x 15 ft x 15 ft glass fronted cage. Wire roof. Wall on one side. Soil and cement substrate. Potted plant and logs. One wooden box. Metal perch. Food in cement trough. Four birds observed. Signboard for Red Breasted Parakeet. Barrier present.

BRAHMINY KITE: 10 ft x 6 ft x 8 ft cage. Cement floor and roof. Rock construction and holes at the back of the cage. One branch. Floor soiled with feces. No food or water observed. Two birds observed. No signboard but barrier present.

SHIKRA AND RED BILLED BLUE MAGPIE: 10 ft x 6 ft x 8 ft cage. Cement substrate. Stony construction inside cage. No food or water observed. Cage extremely dirty. One Shikra and one Red Billed Magpie observed. No signboard but barrier present.

ALBINO JUNGLE CROW: Triangular cage, equilateral, 12 ft sides. 8 ft high. Branches. Straw covering on roof. No food or water observed. One bird observed. No signboard but barrier present.

AVIARY: 110 ft x 45 ft x 25 ft cage. Soil substrate. Semicircular water pool, 30 ft in diameter. Trees inside. Species observed include Greylag Goose, Mandarin Duck, Rosy Pelican, Night Heron, White Stork, White Necked Stork, Common Crane, Black Necked Stork, Bar Headed Goose, Pond Heron, Purple Moorhen, Cattle Egret, Spoonbill, White Ibis, Painted Stork, Demoiselle Crane, Cape Crowned Crane and Lesser Adjutant Stork. Signboard and barrier present.

Reptiles

MARSH CROCODILE: Circular cage, 50 ft in diameter. Soil substrate. Circular water pool, 40 ft in diameter. Algae filled green water and plants on rock islands within pool area. Two crocodiles observed. Signboard and barrier absent.

ROCK PYTHON: 20 ft x 25 ft x 10 ft pit. Soil substrate. Grasses and plants. Logs and stones inside. Stone construction inside. No food observed, dead or alive. One snake observed. Signboard present but no barrier.

RED SAND BOA: 2.5 ft x 5 ft x 4 ft cage with glass front. Cement substrate with stones. Wire roof. One snake observed. Signboard and barrier present.

BENGAL MONITOR LIZARD: 3 ft x 5 ft x 4 ft cage with glass front. Cement substrate. Wire roof. One log. Circular cement water reservoir, 6 inches in diameter. No food observed. One lizard observed. No signboard but barrier present.

ROCK PYTHON: 8 ft x 4 ft x 4 ft glass fronted cage. Cement substrate. Branch inside. Circular water reservoir, 1 ft in diameter. No food observed, dead or alive. Two snakes observed. Signboard and barrier present.

COMMENTARY

Bombay Zoo, built in 1873, is one of the oldest Zoos in India. The Zoo thus gives the impression of an antiquated Victorian age menagerie. Space is cramped and there seems little scope for expansion in the present location.

All enclosures give the impression of prison cells. One of the investigators had visited this Zoo fifteen years ago. The only noticeable change seems to be the elephant enclosure which gives the animals some room to move about. Even in the present enclosure, an elephant was observed chained.

For the most part, animal care appeared inadequate. Environmental enrichment efforts were non-existent. The Zoo seems to have been caught in an urban trap which severely restricts improvement. Barriers were lacking. Many cages were extremely filthy. Most cages did not have water. Stereotypic behaviours were observed in many animals.

Visitor behaviour was abominable and there was no staff supervision in front of enclosures. Educational efforts are poor at best. Conservation efforts are impossible in such an environment and the Zoo has made no effort to justify the captivity of animals for either education or conservation.

Bombay Zoo gives the impression of a relic of a bygone age when animals were displayed for the lewd and vulgar curiosity of the public.

Size: Inadequate in all cases.

Substrate: Principally cement but sand substrates were observed.

Furnishings/Enrichment: Non-existent.

Educational Graphics: Poor.

Safety: Seems adequate for humans but inadequate for animals. Visitors observed tormenting herbivores and carnivores with no Zoo staff in sight.

CONCLUSIONS

Bombay Zoo is a grim reminder of the fact that the Zoo industry is still based on a number of education and conservation myths. It serves neither purpose. Such a facility can only desensitize children and other Zoo visitors by leading them to believe that it is acceptable to treat animals in this manner.

As well, it appears as though many of the bird specimens have been purchased from Crawford Market. If so, the Zoo is complicit in the cruel international trade

in birds in which many perish for every individual that survives.

Clearly there are very serious problems at the Bombay Zoo. The most prudent course of action to address these problems would be closure of the Zoo and dispersal of the existing animal collection to more appropriate accommodation elsewhere.

RECOMMENDATIONS

1. Bombay Zoo should stop breeding all animals.
2. Most animals should be shifted to more appropriate accommodation elsewhere as soon as possible. Humane euthanasia should be considered for severely ill animals which cannot be translocated. Injured animals should be taken off exhibit.
3. All animals must be given access to fresh water at all times.
4. Unfortunately, the deficiencies in the Bombay Zoo are so severe that substantial improvement would be difficult, if not impossible. In particular, the reptile house should be demolished and the reptiles shifted to a better accommodation elsewhere.
5. Single animals like the Indian rhino should be moved immediately. Some of the common native birds may be releasable after a thorough medical check up to ensure they do not spread any disease organisms to their wild counterparts.
6. If the Bombay Zoo is closed down, a valuable educational message will be sent to the community, especially children, who will learn that the welfare of animals should always be a high priority and that if animals cannot be kept properly, they should not be kept at all. Closure of the Zoo could also allow for diversion of at least some funds for more appropriate and genuine conservation projects in the wild.
7. Vigilance should be increased to prevent vandalism by visitors.

VISHAKHAPATNAM ZOO

Vishakhapatnam, Andhra Pradesh—October 6, 2002

INTRODUCTION

Vishakhapatnam Zoo is a relatively new Zoo and has been built around a natural tract of forest to provide a suitable ambience for the animals. The Zoo is spread over several hundred acres of rugged, hilly terrain.

ANIMAL HOUSING AND HUSBANDRY

Mammals

ASIATIC ELEPHANT: Open air enclosure, 650 ft circumference. Dry soil substrate. Mounds, bushes, bamboo clumps and trees inside. No water pool. Three animals; all chained. Mahouts inside enclosure attending animals. Signboard and barrier present.

RHESUS MACAQUE: Circular open air pit-type enclosure. Dry soil substrate. Mounds and logs inside but no trees. One attached den with entrance measuring 2 ft x 3 ft. 10 ft high wall surrounding enclosure. No food or water observed. Nine animals observed. No signboard but barrier present.

DHOLE: Open air enclosure, 120 ft x 90 ft. Enclosure seems part of the natural forest tract with soil substrate. Attached den with 2 ft x 2 ft entrance. 12 ft high wall surrounding enclosure. No food or water noticed. Five animals observed. Signboard and barrier present.

JAGUAR: 50 ft x 100 ft x 20 ft cage. Sloping cage with dry soil substrate. Trees and grassy areas. Water pool, 6 ft x 14 ft. Two attached dens with entrances, 2 ft x 2.5 ft. No food or water observed in cage. Two animals observed. Signboard and barrier.

PUMA: 55 ft x 100 ft x 20 ft cage. Sloping cage with dry soil substrate. Trees, grasses and bamboo clumps inside. Water pool, 6 ft x 14 ft. Two attached dens with

entrances, 2 ft x 2.5 ft. No food or water observed in cage. One animal observed. Signboard and barrier.

SAMBAR: 500 ft x 150 ft paddock. Dry soil substrate with grass and trees. 5 ft wide dry moat. 8 ft high wall surrounding enclosure. Browse on the ground. No water facility observed. Three animals observed. Signboard and barrier present.

LION: 250 ft x 150 ft open air enclosure. Dry soil substrate. Trees and bamboo clumps inside. Dry moat, 10 ft wide. 12 ft high wall surrounding enclosure. No food or water observed inside enclosure. Two animals observed. Signboard and barrier present. Subspecies not indicated on signboard.

HIMALAYAN BLACK BEAR: Elliptical open air enclosure, 200 ft major axis. Vegetation inside enclosure. Attached shelter. Surrounding wall, 15 ft high. No food or water observed. Two animals observed. No signboard but barrier present.

SLOTH BEAR: Open air enclosure, 120 ft x 50 ft. Vegetation inside enclosure. Attached shelter. 6 ft wide dry moat. Surrounding wall, 15 ft high. No food or water observed. Two animals observed. No signboard but barrier present.

SLOTH BEAR: Open air enclosure, 270 ft x 60 ft. Vegetation inside enclosure. Attached shelter with 2 ft x 2 ft x 2 ft entrance. 6 ft wide dry moat. Surrounding wall, 15 ft high. No food or water observed. Two animals observed. No signboard but barrier present.

WOLF: Circular pit-type open air enclosure, 160 ft circumference. Dry soil substrate, mounds, trees and bamboo clumps inside enclosure. Large holes in the substrate. Attached den. No food or water observed. Three animals observed. Signboard and barrier present.

JACKAL: Circular pit-type open air enclosure, 170 ft circumference. Dry soil substrate, mounds, trees and bamboo clumps inside enclosure. Attached den. No food or water observed. One animal observed. Signboard and barrier present.

STRIPED HYENA: Circular pit-type open air enclosure, 160 ft circumference. Dry soil substrate, mounds, trees and bamboo clumps inside enclosure. Large holes in the substrate. Attached den. No food or water observed. Three animals observed. Signboard and barrier present.

HIPPOPOTAMUS: Open air paddock, 250 ft circumference. Dry soil substrate. Water facility as the perimeter, 10 ft wide and 6 ft deep. Two pools, one dry, 7 ft x 14 ft and 10 ft x 30 ft. Enclosure having a separate adjacent land area of 50 ft x 70 ft. One animal observed. Signboard and barrier present.

Birds

PEAFOWL: Triangular paddock with sides 80 ft, 70 ft and 50 ft. Sloping enclosure with dry soil substrate. Trees and grasses inside. Dry pool, 12 ft x 12 ft. Two birds observed. No signboard but barrier present.

MIXED SPECIES AVIARY: 65 ft x 95 ft x 25 ft cage. Sloping floor. Hard soil substrate. Two pools, one dry, each 10 ft x 15 ft. Trees and metal perches inside. No food and water noticed inside. Various species exhibited; Tawny Eagle, Black Kite, White Scavenger Vulture, Long Legged Buzzard and White Backed Vulture. Signboard and barrier present.

MOLUCCAN SALMON-CRESTED COCKATOO: 20 ft x 16 ft x 16 ft cage. Dry soil substrate. One side of the cage walled and having 10 depressions. Two wooden boxes. One cement water pot, 6 inches in diameter. Logs, plants and a hanging bowl. No food and water observed. One bird observed. Signboard and barrier present.

ECLECTUS PARROT: 20 ft x 16 ft x 11 ft cage. Dry soil substrate. One side of the cage walled and having 10 depressions. One wooden box. One cement water pot, 6 inches in diameter. Logs, plants and a hanging bowl. One metal swing. No food and water observed. One bird observed. Signboard and barrier present.

BLUE AND YELLOW MACAW: 20 ft x 16 ft x 11 ft cage. Dry soil substrate. One side of the cage walled and having 10 depressions. One wooden box. One cement water pot, 6 inches in diameter. Logs, plants and a hanging bowl. One metal swing. No food and water observed. One bird observed. Signboard and barrier present.

PIED HORNBILL: 20 ft x 16 ft x 11 ft cage. Dry soil substrate. One side of the cage walled and having 10 depressions. One wooden box. One cement water pot, 6 inches in diameter. Logs, plants and a hanging bowl. One metal swing. No food and water observed. One bird observed. Signboard and barrier present.

CHINESE SILVER PHEASANT: 12 ft x 12 ft x 8 ft cage. Hard soil substrate. Vegetation. No food and water observed. Two birds observed; one male and one female. Signboard and barrier absent.

PEAFOWL: 18 ft x 15 ft x 8 ft cage. Sloping cage with hard soil substrate. Vegetation. One water pot. Food strewn on the ground. Six birds observed. Signboard and barrier present.

ALEXANDRINE PARAKEET: 8 ft x 15 ft x 8 ft cage. Sand substrate. Shrubs, logs and wooden swing inside. Four wooden nesting boxes. One cement water pot. Food and water observed inside. Four birds observed. Signboard and barrier present.

Reptiles

ROCK PYTHON: Circular pit, 130 ft circumference. Soil substrate. Grasses, trees and logs inside. One water pool, 8 ft x 10 ft. 8 ft high wall surrounding enclosure. Three snakes observed. Signboard and barrier present.

MARSH CROCODILE: Oval open air enclosure, major axis 90 ft. Sloping enclosure with dry soil substrate. Trees and bamboo clumps. One water pool, oval, 35 ft major axis. 5 ft high wall surrounding enclosure. 14 animals observed. Signboard and barrier present.

COMMENTARY

The Zoo seems generally well maintained and the majority of the enclosures are open air and spacious. Most animals appear to be physically and mentally healthy. The Zoo is melded with the existing forest giving both animals and visitors a suitably natural ambience.

Other than the ubiquitous signboards that are present in every Zoo, there seems to be no educational programming. Visitors are not provided with information about why animals are being held and exhibited. The Zoo, though well laid out, doesn't seem to serve any purpose other than entertainment.

Size: Cage size seems adequate in most cases. However, the wolf cage seems far too small to properly satisfy the biological and behavioral needs of these pack animals. Some of the bird cages seem undersized as well.

Substrate: For most of the enclosures, the substrate is natural earth.

Furnishings/Enrichment: Some of the parrot cages are equipped with furnishings but most of the exhibits lack environmental enrichment.

Educational Graphics: The signboards at this Zoo are basic. There is nothing particularly noteworthy or distinctive about them.

Safety: Appears acceptable for Zoo visitors. However, labourers and keepers were observed working inside the tiger enclosure when the animals were sleeping. A keeper kept guard, ready to blow a whistle to alert the workers, if the tigers came toward them. This seems like a very dangerous work method.

CONCLUSIONS

Vishakhapatnam Zoo has the potential to become an effective nature education centre. They should direct more effort toward genuine conservation and education initiatives rather than the token efforts observed now. Having said that, this is a much better captive animal facility than the majority of others visited during the course of this investigation.

RECOMMENDATIONS

1. An institution wide program of environmental enrichment should be developed and implemented.
2. Signboards should be made more attractive, interactive and comprehensive.
3. Consideration should be given to becoming more of a rescue and conservation center that is directly involved in in-situ conservation work.

WEST BENGAL SNAKE PARK

Badu, West Bengal—June 4th, 2002

INTRODUCTION

West Bengal Snake Park is located adjacent to Calcutta Snake Park and is owned by Ramprasad Mitra, the elder brother of the owner of the Calcutta Snake Park, Dipak Mitra. This snake park was reportedly started in 1975 and was closed during the early nineties due to financial difficulties. However, the proprietor informed the Zoo investigators that the Zoo was opened again in 1995.

ANIMAL HOUSING AND HUSBANDRY

Reptiles

BLACK COBRA: Circular cage about 1 ft in diameter x 1.5 ft high. Dry, hard, mud substrate. No food or water observed. No branches or other furnishings. One snake observed. Individual looked extremely thin with noticeably protruding bones. Barrier fencing in front of cage. Cage signboard indicated Black cobra, but snake appeared to be Monocellate Cobra.

MONOCELLATE COBRA: Circular cage about 1 ft in diameter x 1.5 ft high. Dry, hard, mud substrate. No food or water observed. One snake observed. Individual looked extremely thin with noticeably protruding bones. Barrier fencing in front of cage.

MONOCELLATE COBRA: Circular cage measuring about 1 ft in diameter x 1.5 ft high. Dry, hard, mud substrate. No food or water observed. No furnishings present in enclosure. One snake observed. Individual looked extremely thin with protruding bones. Individual looked like half dead. Barrier fencing present.

RUSSELL'S VIPER: 1 ft diameter x 1.5 ft high circular cage. Dry, hard, mud substrate. No food or water observed. No furnishings. One snake observed. Barrier fencing in front of cage.

COMMON SAND BOA: Wooden cage with glass front. 2.5 ft x 1.5 ft x 1 ft. Hard, dry, wooden flooring. No furnishings. No food or water observed. Four individual snakes observed. No barrier fencing in front of cage.

BRONZEBACK TREE SNAKE & RUSSELL'S VIPER: Mixed species wooden enclosure with glass front measuring approximately 3.5 ft x 1.5 ft x 1 ft. Hard, dry, wooden flooring. No furnishings. One Bronzeback Tree Snake and six young Russell's Vipers, each around six to eight inches in length. No food or water observed. No barrier fencing in front of this cage.

MONOCELLATE COBRA: Open air enclosure measuring approximately 10 ft x 12 ft x 3.5 ft. Sparse vegetation in exhibit. Tiled shelter inside. Four snakes were observed. No water.

BANDED KRAIT: Open air enclosure approximately 10 ft x 12 ft x 3.5 ft. Sparse vegetation inside cage. No snakes were observed. No barrier fencing in front of cage.

RUSSELL'S VIPER: Open air enclosure about 10 ft x 12 ft x 3.5 ft. Sparse vegetation inside cage. Two snakes observed. No barrier fencing in front of cage.

RUSSELL'S VIPER: Open air enclosure. 10 ft x 12 ft x 3.5 ft. Sparse vegetation inside cage. Two snakes observed. No barrier fencing in front of cage.

EDUCATIONAL ENCLOSURE: Circular cage about 5 ft in diameter. Hard, dry, mud substrate. Many species inside including Banded Krait, Monocellate Cobra, Red Sand Boa, Russell's Viper, Rat Snake and Ornamental Snake. There were four Banded Kraits, four Monocellate Cobras, two Red Sand Boas, one Russell's Viper, two Rat Snakes and one Ornamental Snake. The Ornamental Snake was kept inside a wooden box with a lid. This enclosure is used to deliver edu-

cational talks by the owner who handles the snakes during the presentations. The cage is 7 ft high with a covered top and is built of wire mesh.

Birds

PEACH FACED LOVE BIRD: Wooden cage with wire front. 2 ft x 2.5 ft x 2.5 ft. No branches or furnishings. Cage extremely dirty. No food or water bowl inside. Two birds inside.

BUDGERIGARS: Wooden cage with wire front. 2 ft x 2.5 ft x 2.5 ft. No branches. Two birds inside. Cage extremely dirty. No food or water bowl inside.

COCKATIEL: Wooden cage with wire mesh front measuring approximately 3 ft x 2 ft x 2.5 ft. No perches, branches or nesting material. No food and water. Cage dirty and stinking. Three birds observed.

COMMENTARY

This facility seems rundown and in various stages of decay. Most of the snake cages had cracked glass and broken wood. Cage signs were often absent. When they were present they were often badly presented. Stand-off barriers to keep the public a safe distance from the animal cages were broken or absent at many exhibits.

Apart from the open air enclosures for snakes, none of the holding facilities appeared suitable for the long-term housing of reptiles. Conditions are plainly not fit as can be observed by any visitor with even a passing interest in animal welfare.

A short conversation with the owner revealed that he is aware of the inadequate facilities. He commented that it was due to lack of funding. Reportedly, this park is in financial difficulty.

It is to be noted that throughout the visit, the two investigators were the only visitors inside the park. Not a single other person was present.

The West Bengal Snake Park does not appear to serve any worthwhile conservation, education or research purpose, except perhaps the production of snake venom for medicinal purposes.

RECOMMENDATIONS

1. The West Bengal Snake Park is located in a poor location and is rundown, apparently due to lack of funding and support. This facility should voluntarily close itself down and disperse its live animal collection to more appropriate accommodation elsewhere.

CONCLUSIONS

Throughout the field notes of the 27 Zoos reviewed in this report, a significant number of common problems were identified. While some of these problems are easily rectified, others are systemic in nature and will require considerable effort to address.

In some cases, the conditions encountered in specific Zoos were so poor, the investigators recommended phase out or closure of the facility and transfer of the animals to more appropriate accommodation elsewhere. In other cases, they recommended improvement or reform.

Clearly there are a wide variety of problems in India's Zoos and many of them are serious. As public knowledge about animals grows, and with it, concern about the welfare of wild animals in captivity, India's Zoos are at a crossroads. They can voluntarily embrace change, improving, reforming and adapting, becoming true institutions of education, conservation and animal welfare in the process, or they can stay in the past, keeping animals in antiquated, usually substandard, menagerie-style conditions for public amusement. Hard decisions will have to be made and traditional ways of thinking will have to be reevaluated.

Each of India's Zoos must take a long, hard look at what they do and why. All Indian Zoos should make animal welfare and conservation their highest priorities.

The Central Zoo Authority, India's governing body for Zoos, must be progressive, proactive and provide leadership that will facilitate the improvement and evolution of India's Zoos. All of India's Zoos must be brought up to an acceptable, professional standard in which animals are housed and cared for humanely and with dignity and respect.

RECOMMENDATIONS

1. All Zoos must accept and work to achieve accepted international, professional welfare standards for all animals in their care.
2. All Zoos must recognize and make serious efforts to address the complete range of biological and behavioural needs of the animals in their care. Zoos must provide ample space, complex furnishings, appropriate environmental conditions and natural social situations that allow animals to move about and behave naturally and that result in a high quality of life.
3. Zoos that cannot properly house and care for particular, often problematic, species (such as elephants), must recognize that fact and move those animals to more appropriate accommodation elsewhere.
4. All Zoos must make serious efforts to reduce the number of non-endangered animals in their collections and to stop their breeding and acquisition. This can be achieved by controlling breeding; not replacing animals as they expire and restricting new acquisitions.
5. All Zoos that keep threatened or endangered species should ensure that they are maintained according to the highest possible standards and that they are part of a legitimate captive propagation conservation initiative.
6. All Zoos should develop and deliver comprehensive educational programs that promote animal welfare and conservation. These programs should not involve the exploitation of animals in circus-type shows or performances, photo sessions or any other activity that may compromise the physical or psychological well being of the animals.

7. All Zoos must protect both animals and visitors from each other. Strict policies prohibiting public feeding and harassment of animals should be developed and enforced.
8. All Zoos must support (technically, materially, financially) in-situ conservation projects.
9. The Central Zoo Authority should take immediate steps to close down all unrecognized Zoos and all grossly substandard Zoos that do not meet their prescribed standards and norms for animal housing and care.

APPENDIX 1

Collection Lists

ALLEN FOREST ZOO

Indian Giant Squirrel
Himalayan Black Bear
Tiger
Sloth Bear
Asiatic Lion
Indian Rhinoceros
Orangutan
Chimpanzee
Hippopotamus
Burchell's Zebra
Axis Deer
Nilgai
Blackbuck
Swamp Deer
Striped Hyena
Chowsinga
Sika Deer
Sangai
Jungle Cat
Kinkajou
Leopard Cat
Common Palm Civet
Indian Porcupine
Barking Deer
Hog Deer
Jackal
Sambar
Leopard
Red Fox
Indian Fox
Squirrel Monkey
White-Throated Capuchin
Bonnet Monkey
Brown Capuchin
Japanese Macaque

Birds

Lady Amherst Pheasant
Kaleej Pheasant
Ring-Necked Pheasant
Golden Pheasant

Chinese Silver Pheasant
Java Sparrow
Zebra Finch
Fantail Pigeon
Reeves Pheasant
White-Crested Cockatoo
Eastern Rosella
Pale-Headed Rosella
Bare-Eyed Cockatoo
Peafowl
Mallard Duck
Emu
Rosy Pelican
Flamingo

Reptiles

Marsh Crocodile
Gharial
Spectacled Caiman

ARIGNAR ANNA ZOOLOGICAL PARK

Nilgiri Langur
Lion Tailed Macaque
Chimpanzee
Savannah Baboon
Grey Cheeked Mangabey
Rhesus Macaque
Brown Capuchin Monkey
Common Langur
Barking Deer
Blackbuck
Axis Deer
Gaur
Hog Deer
Common Otter
Sambar
Nilgai
Lion (Hybrid)
Sangai
Grizzled Giant Squirrel
Indian Giant Squirrel

Indian Wild Ass
Wolf
Striped Hyena
Dhole
Sloth Bear
Himalayan Black Bear
Jackal
Tiger
Jaguar
Leopard
Grant's Zebra
Giraffe

Birds

Indian Peafowl
Albino Peafowl
Sulphur Crested Cockatoo
Great Sulphur Crested Cockatoo
Red Billed Blue
Grey Jungle Fowl
Guinea Fowl
Grey Cockatiel
Silver Pheasant
Grey Hornbill
White Peafowl
Oriental Turtle Dove
Large Indian & Rose Ringed Parakeet
Scarlet Macaw
Peach Faced Lovebird
White Browed Bulbul
White Cockatiel
Pearl Cockatiel
Blossom Headed Parakeet
Red-Breasted Parakeet
Grey Partridge
Indian Koel
White Domestic Chicken
Shikras
Sarus Crane
White-Necked Stork
Adjutant Stork
Emu
White-Backed Vulture
Black Kite
Southern Hill Mynah
Rosy Pelican

Reptiles

Starred Tortoise
Madras Pond Turtle
Water Monitor

Green Iguana
Spectacled Caiman
Banded Krait
Chameleon
Common Sand Boa
Rock Python
Rat Snake
Binocellate
Russell's viper
Checkered Keelback Water Snake
Green Whip Snake
King Cobra
Estuarine Crocodile
American Alligator
Nile Crocodile
Marsh Crocodile
Morelet's Crocodile
Gharial

Nocturnal House

Common Palm Civet
Jungle Cat
Small Indian Civet
Binturong
Horned Eagle Owl
Barn Owl
Indian Porcupine
Grey Kangaroo
Pygmy Hippopotamus
River Hippopotamus
Asian Elephant
Wild Boar

AURANGABAD ZOO

Blackbuck
Wolf
Common Palm Civet
Common Langur
Jackal
Striped Hyena
Indian Porcupine
Sambar
Chinkara (Indian Gazelle)
Axis Deer
Nilgai
White Tiger
African Lion
Leopard
Assamese Macaque

Bonnet Macaque
Asian Elephant

Birds

Painted Stork
Ruddy Shelduck
Cattle Egret
Heron (unidentified)

Reptiles

Marsh Crocodile
Russell's Viper
Common Earth Snake
Red Sand Boa
Indian Cobra
Rock Python
Common Krait
Green Snake
Trinket Snake
Rat Snake
Indian Racer Snake
Common Monitor Lizard
Starred Tortoise

BONDLA ZOO

Wild Boar
Asiatic Elephant
Sambar
Axis Deer
Blackbuck
Sloth Bear
Leopard
Jackal
Indian Porcupine
Barking Deer
Gaur
Palm Civet
Mouse Deer

Birds

Peafowl

Reptiles

Marsh Crocodile
Chameleon
Rock Python
Cobra
Green Whip Snake
Russell's Viper

Green Pit Viper
Bronze-Backed Tree Snake
Common Krait
Trinket Snake
Common Sand Boa
Hump Nosed Pit Viper
Ornamental Snake
Rat Snake

BANNERGHATTA ZOO

Sloth Bear
Jungle Cat
Small Indian Civet
Rhesus Macaque
Assamese Macaque
Capped Langur
Striped Hyena
Asian Elephant
River Hippopotamus
Malabar Giant Squirrel
Wild Boar
Indian Porcupine
Mithun
Leopard
Grant's Zebra
Jackal

Birds

Albino Peafowl
Domestic Goose
Pigeon
Black Headed Munia
Grey Partridge
Budgerigar
Weaver Bird
Barn Owl
Mottled Wood Owl
Painted Stork
Spoonbill
Pond Heron
Purple Moorhen
Grey Pelican
Tufted Pochard
Brahminy Duck
Bar-Headed Goose
Peafowl
Red-Crested Pochard
Rose-Ringed Parakeet
Large Indian Parakeet

Reptiles

Cobra
Water Monitor
Gharial
Spectacled Caiman
Marsh Crocodile
Star Tortoise
Common Indian Monitor Lizard
Green Iguana
Checkered Keelback Water Snake
King Cobra
Rock Python
Russell's Viper
Red Sand Boa

CALCUTTA SNAKE PARK

Macaque (unidentified)
Civet
Guinea Pig
Rabbit
Axis Deer

Birds

Cockatiel
Budgerigar
Java Sparrow
Love Bird
Turkey
Fantail Pigeon
Rose Ringed Parakeet
Japanese Quail

Reptiles

Rock Python
King Cobra
Monocellate Cobra
Russell's Viper
Starred Tortoise
Banded Krait
Marsh Crocodile
Bronzeback Tree Snake
Striped Keelback Snake
Wolf Snake
Tuctoo Gecko
Common Sand Boa
Olive Keelback Water Snake
Common Krait
Common Water Snake
Ornamental Snake

Rat Snake
Spectacled Cobra
Vine Snake
Red Sand Boa
Water Monitor
Yellow Monitor
Marsh Crocodile
Checkered Keelback
Spectacled Cobra
Green Whip Snake

DARJEELING ZOO

Red Panda
Himalayan Palm Civet
Slow Loris
Himalayan Black Bear
Langur
Tibetan Wolf
Siberian Tiger
Clouded Leopard
Common Leopard
Snow Leopard
Yak
Himalayan Tahr
Bharal (Blue Sheep)
Markhor
Goral
Barking Deer
Serow

Birds

Bhutan Grey Peacock
Kalij Pheasant
Himalayan Monal Pheasant
Golden Pheasant
Silver Pheasant
Red Jungle Fowl
Lady Amherst's Pheasant
Japanese Green Pheasant

GUINDY ZOO

Axis Deer
Dhole
Striped Hyena
Indian Porcupine
Sambar Deer
Asian Elephant

Blackbuck
Jungle Cat
Chowsinga Antelope
Rhesus Macaque
Common Palm Civet
Jackal
Bengal Fox
Nilgiri Langur
Common Langur
Lion-Tailed Macaque
Bonnet Macaque
Common Otter
Barking Deer

Birds

Bengal Vulture
White-Bellied Sea Eagle
Black Kite
Horned Eagle Owl
Emu
Indian Peafowl
Sarus Crane
White Peafowl
Black-Headed Munia
White-Bellied Munia
Spotted Munia
Common Quail
Guinea Fowl
Manila Goose
Alexandrine Parakeet
Rose-Ringed Parakeet
Rock Pigeon
Silky Fowl
Barn Owl
Budgerigar
Peach-Faced Lovebird
Cockatiel

Reptiles

Starred Tortoise
Common Indian Monitor
Estuarine Crocodile
Rock Python
Binocellate Cobra
Madras Pond Turtle
Rat Snake
Marsh Crocodile

HYDERABAD ZOO

Black and White Colobus Monkey
Orangutan
Chimpanzee
Vervet Monkey
Capped Langur
Rhesus Macaque
Patas Monkey
Chacma Baboon
Olive Baboon
Hamadryas Baboon
Wolf's Monkey
Lion-Tailed Macaque
Axis Deer
Tiger
Wolf
Jaguar
Striped Hyena
Puma
Dhole
Jackal
Indian Fox
Leopard
Lion
Wild Boar
River Hippopotamus
Indian Rhinoceros
Malayan Sun Bear
Himalayan Black Bear
Ratel
Asiatic Elephant
Swamp Deer
Sangai
Guar
Asiatic Wild Ass
Sambar
Blackbuck
Nilgai
Slender Loris
Common Palm Civet
Small Indian Civet
Indian Porcupine
Fulvous Fruit Bat
Flying Fox
Jungle Cat
Common Otter

Birds

Common Peafowl
White Ibis
Painted Stork
Adjutant Stork
Emu
Weaver Bird
Malabar Pied Hornbill
Common Myna
Ring Dove
Spotted Dove
Rufous Turtle Dove
Blue-Crowned Pigeon
Nicobar Pigeon
White Crested Laughing Thrush
Rose-Ringed Parakeet
Red Breasted Parakeet
Lady Amherst's Pheasant
Ring-Necked Pheasant
Golden Pheasant
Chinese Silver Pheasant
Reeves Pheasant
Grey Peacock Pheasant
Kaleej Pheasant
White-Necked Stork
Spoonbill
Purple Moorehen
Lesser Whistling Teal
Black Necked Stork
Sarus Crane
Ruddy Shelduck
Greylag Goose
Grey Heron
Bar-Head Goose
Flamingo
Grey Pelican
Rufous Necked Hornbill
Great Pied Hornbill
Wreathed Hornbill
Malabar Pied Hornbill
Common Grey Hornbill
Egyptian Vulture
King Vulture
Tawney Eagle
Kestrel
Shikra
White-Eyed Buzzard
Brahminy Kite
Longbilled Vulture
Budgerigar
Fischer's Lovebird

Peach-Faced Lovebird
Green Peafowl
Cockatiel
Slaty-Headed Parakeet
Mottled Wood Owl
Brown Fish Owl
Barn Owl
Great Horned Owl
Spotted Owlet
Chattering Lory
Plum-Headed Parakeet
Violet-Necked Lory
Pale Rosella
Rainbow Lory
Military Macaw
White Cockatoo
Goffin's Cockatoo
Sulphur Crested Cockatoo
Salmon Crested Cockatoo
African Grey Parrot
Blue and Yellow Macaw
Green-Winged Macaw
Masked Lovebird
Red-Masked Conure
Patagonian Conure
Blue-Fronted Amazon
Grey Partridge
Red Jungle Fowl

Reptiles

Galapagos Giant Tortoise
Gharial
Marsh Crocodile
Saltwater Crocodile
Water Monitor Spectacled Caiman
Rock Python
Reticulated Python
Russell's Viper
Indian Cobra
King Cobra
Red Sand Boa
Common Rat Snake
Whip Snake
Checkered Keelback Water Snake
Olive Keelback Water Snake
Common Monitor Lizard
Common Krait
Rock Lizard
Indian Chameleon
Starred Tortoise

KATRAJ RESCUE CENTRE & RAJIV GHANDI ZOO

RESCUE CENTRE

Rhesus Macaque
Leopard
Grey Langur

Birds

Toucan
Grey Hornbill
Peafowl
Black Kite
Cinereous Vulture

SNAKE PARK

Reptiles

Rat Snake
Common Krait
Saw Scaled Viper
Starred Tortoise
Marsh Crocodile
Gharial
Bengal Monitor Lizard
Rock Python
Russell's Viper
Common Wolf Snake
Pit Viper
Softshell Turtle
Slider Terrapin
Indian Cobra
Vine Snake
Red Sand Boa
Trinket Snake
Checkered Keelback Snake
Green Keelback Sna

MADRAS CROCODILE BANK

Reptiles

Red Crowned Roof Turtle
Striped Roof Turtle
Small Roofed Turtle
Reticulated Python
Indian Flapshell Turtle
Crowned River Turtle
River Terrapin
Indian Black Turtle

Gharial
American Alligator
False Gharial
Saltwater Crocodile
Morelet's Crocodile
West African Dwarf Crocodile
Marsh Crocodile
Slender Snouted Crocodile
Water Monitor
Green Iguana
Siamese Crocodile
Nile Crocodile
Spectacled Caiman
King Cobra

MADRAS SNAKE PARK

Reptiles

Green Iguana
Marsh Crocodile
Reticulated Python
Rock Python
Trinket Snake
Bronzeback Tree Snake
Common Sand Boa
Red Sand Boa
Vine Snake
Common Wolf Snake
Rat Snake
Striped Keelback Snake
Checkered Keelback Snake
Olive Keelback Snake
Rock Agama
Indian Monitor
Rock Gecko
Indian Chameleon
Water Monitor
Yellow Monitor
Indian Monitor
Starred Tortoise
Indian Flapshell Turtle
Madras Pond Turtle
Yellow Sea Snake
Red-Eared Slider
Morelet's Crocodile
Spectacle Caiman
West African Dwarf Crocodile
Siamese Crocodile
Estuarine Crocodile
Marsh Crocodile

Gharial
Aldabra Tortoise
Spectacled Cobra
Indian Cobra
Black Cobra
Common Krait
Saw Scaled Viper

MAHENDRA CHOUDHURY ZOOLOGICAL PARK

Assamese Macaque
Rhesus Macaque
Common Langur
Capped Langur
Bonnet Macaque
Lion-Tailed Macaque
Pig-Tailed Macaque
Chimpanzee
Tiger
Leopard
Asiatic Lion
Jaguar
Wild Boar
River Hippopotamus
Indian Rhinoceros
Asiatic Elephant
Striped Hyena
Sloth Bear
Himalayan Black Bear
Common Palm Civet
Siamese Cat
Jackal
Hog Deer
Pangolin
Brown Bear
Porcupine
Barking Deer
Brow Antlered Deer
Chinkara
Sambar
Blackbuck
Burchell's Zebra
Swamp Deer
Mithun
Nilgai
African Cape Buffalo
Otter

Birds

Emu
Comb Duck
Common Crane
Brahminy Duck
Bar-Headed Goose
White Stork
Black-Necked Stork
Painted Stork
Golden Pheasant
Red Jungle Fowl
Mongolian Ring Pheasant
Peafowl
Sarus Crane
Cormorant
Spotbill Duck
Sulphur Crested Cockatoo

Reptiles

Marsh Crocodile
Gharial

NEW DELHI ZOOLOGICAL PARK

Hoolock Gibbon
Common Langur
Rhesus Macaque
Bonnet Macaque
Lion-Tailed Macaque
Hamadryas Baboon
Chimpanzee
Tiger
Leopard
Jaguar
Asiatic Lion
African Lion
Jackal
Striped Hyena
Axis Deer
Sloth Bear
Himalayan Black Bear
Common Otter
African Elephant
Asiatic Elephant
Goral
Giraffe
Chinkara
River Hippopotamus
Hog Deer
African Cape Buffalo

Blackbuck
Indian Rhinoceros
Sangai
Nilgai
Sika Deer
Sambar
Banteng
Common Palm Civet
Small Indian Civet
Leopard Cat
Fishing Cat
Barking Deer
Red Lechwe
Swamp Deer
Chowsinga
Mithun

Birds

Edward's Pheasant
Ring-Necked Pheasant
Red Jungle Fowl
Grey Partridge
Kaleej Pheasant
Chinese Silver Pheasant
Golden Pheasant
Java Sparrow
Red Munia
Spotted Munia
Blackheaded Munia
Budgerigar
Emu
Peafowl
Green Imperial Pigeon
Grey Hornbill
White Throated Laughing Thrush
Hill Myna
Rainbow Lorekeet
Large Indian Parakeet
Rose-Ringed Parakeet
Red Breasted Parakeet
Blossom Headed Parakeet
Barn Owl
Shikra
Great Horned Owl
Black Kite
Cockatiel
Rosella
Red Rumped Parrot
Green Pheasant
Military Macaw
Moluccan Cockatoo

African Grey Parrot
Bare-Eyed Cockatoo
Illiger's Macaw
Sulphur Crested Cockatoo
Peach Fronted Conure
Eclectus Parrot
Blue and Yellow Macaw
Crowned Crane
Patagonian Conure
Scarlet Macaw

Reptiles

American Alligator
Siamese Crocodile
Marsh Crocodile
Gharial
Rock Python
King Cobra
Diademed Snake
Rat Snake
Regal Python
Common Monitor
Red Sand Boa
Dog-Faced Water Snake

PESHWE PARK ZOO

Blackbuck
Chinkara
Orangutan
Lion-Tailed Macaque
Leopard
Tiger
White Tiger
Sloth Bear

Birds

Common Peafowl
Chinese Silver Pheasant
Indian Red Breasted Parakeet
Moluccan Cockatoo
Cassowary

**PIMPRI CHINCHWAD SNAKE PARK AND
RESCUE CENTER**

Jackal
Leopard
Bonnet Macaque
Rhesus Macaque
Grey Langur
Malabar Squirrel
Guinea Pig

Birds

Red-Eared Conure
Guinea Fowl
Shikra
Chinese Silver Pheasant
Barn Owl
Mottled Wood Owl
Great Horned Owl
Coot
Alexandrine Parakeet
Rose-Ringed Parakeet
Cockatiel
Ring-Necked Pheasant
Common Peafowl

Reptiles

Rat Snake
Common Cobra
Checkered Keelback Water Snake
Russell's Viper
Green Keelback Snake
Trinket Snake
Rock Python
Bamboo Pit Viper
King Cobra
Starred Tortoise
Marsh Crocodile

PRINCE OF WALES ZOO

Indian Porcupine
Blackbuck
Hog Deer
Swamp Deer
Barking Deer
Sambar
Asiatic Elephant
Rhesus Monkey
Stump-Tailed Macaque

Bonnet Macaque
Brown Capuchin Monkey
Sloth Bear
Himalayan Black Bear
Leopard
Tiger
Lion
Sangai
Hoolock Gibbon
Hamadryas Baboon
Giraffe
Zebra
Axis Deer
Indian Rhinoceros
Wolf
Striped Hyena
Jackal
River Hippopotamus

Birds

Rosy Pastor
Japanese Quail
Tree Pie
Silver Pheasant
Black-Necked Stork
Peafowl
Emu
White Ibis
Painted Stork
Rosy Pelican
Flamingo
White Stork
Spoonbill
Demoiselle Crane
Sarus Crane
Common Crane
Purple Moorhen
Grey Partridge
Grey Hornbill
Black-Headed Munia
Red Munia
Yellow Throated Sparrow
Java Sparrow
Spotted Munia
Alexandrine Parrot
Black-Capped Lory
Blossom Headed Parakeet
Rose Ringed Parakeet
Great Indian Hornbill
Kaleej Pheasant
Ring-Necked Pheasant

Golden Pheasant
Reeves Pheasant
Cockatiel
Lady Amherst's Pheasant
Rose-Crested Cockatoo
Blue and Gold Macaw

Reptiles

Marsh Crocodile
Gharial
Common Sand Boa
Cobra
Russell's Viper
Rat Snake
Monitor Lizard
Rock Python

RANCHI ZOO

Tiger
Leopard
Striped Hyena
Common Langur
Indian Porcupine
Leopard Cat
Jungle Cat
Lion
Sloth Bear
Himalayan Black Bear
Sambar
Nilgai
Barking Deer
Axis Deer
Indian Rhinoceros
Asian Elephant
Rhesus Macaque

Birds

White Peafowl
Domestic Duck
Black Ibis
Common Peafowl
Rosy Pelican
Guinea Fowl

Reptiles

Marsh Crocodile
Gharial

SANJAY GANDHI BIOLOGICAL PARK

Rhesus Macaque
Assamese Macaque
Lion-Tailed Macaque
Grey Langur
Slow Loris
Striped Hyena
Leopard
Clouded Leopard
Tiger
Lion
Himalayan Black Bear
Jackal
Fishing Cat
Jungle Cat
Golden Cat
Indian Giant Squirrel
Indian Porcupine
Zebra
Axis Deer
Sangai
Hippopotamus
Blackbuck
Hog Deer
Nilgai
Sambar
Albino Fallow Deer
Indian Rhinoceros
Asiatic Elephant

Birds

Japanese Quail
Green Pigeon
Spotted Dove
Ringed Dove
Weaver Bird
Budgerigar
Cockatiel
Rose-Ringed Parakeet
Blossom Headed Parakeet
Alexandrine Parrot
Blue Rock Pigeon
Bar-Headed Goose
Ruddy Shelduck
White-Eyed Pochard
Lesser Whistling Teal
Indian Peafowl
Lady Amherst's Pheasant
Turkey
White Ibis

Black Kite
Barn Owl
Great Horned Owl
Kestrel
Black-Winged Kite
Shikra
Lesser-Pied Hornbill
Wreathed Hornbill
Pied Hornbill
Great Indian Hornbill
Grey Hornbill
Bare Cockatoo
Hill Mynah
Sarus Crane
Black-Necked Crane
Cassowary
Emu
Rosy Pelican

Reptiles

Soft-Shelled Turtle
Marsh Crocodile
Gharial
Monocellate Cobra
Rat Snake
Rock Python
Common Indian Monitor
Checkered Keelback Water Snake
Common Sand Boa

SHIMOGA SAFARI AND ZOO

Indian Giant Squirrel
Indian Porcupine
Rhesus Macaque
Leopard
Sloth Bear
Striped Hyena
Jackal

Birds

Guinea Fowl
Indian Peafowl
Domestic Pigeon
Rose-Ringed Parakeet
Fantail Pigeon

Reptiles

Marsh Crocodile
Rock Python

SHRI CHAMARAJENDRA ZOO

Giraffe
Common Palm Civet
Leopard Cat
Wallaby
Sika Deer
Fallow Deer
Gaur
Common Otter
Common Marmoset
Rhesus Macaque
Assamese Macaque
Lion-Tailed Macaque
Hamadryas Baboon
Chacma Baboon
Mandrill
Gorilla
Chimpanzee
Brown Lemur
Nilgiri Langur
Tiger
Lion
Leopard
Sloth Bear
Himalayan Black Bear
Maned Wolf
Jackal
Striped Hyena
 Binturong
Brazilian Tapir
White Rhinoceros
Indian Rhinoceros
Black Rhinoceros
Grant's Zebra
Four-Horned Antelope
Axis Deer
Hog Deer
Swamp Deer
Blackbuck
Nilgai
Sambar
Mithun
Muntjac
African Elephant
Asian Elephant
Hippopotamus
Wild Boar

Birds

Budgerigar
Peach Faced Lovebird
Cockatle
Indian Pied Hornbill
Great Indian Hornbill
Emu
Peafowl
Cape Crowned Crane
Flamingo
Burmese Peafowl
Indian Peafowl
Rose-Ringed Parakeet
Reeves Pheasant
Grey Jungle Fowl
King Vulture
Black Kite
Adjutant Stork
Black-Necked Stork
Painted Stork
Spoonbill
Sarus Crane
Night Heron
Black Stork
Rosy Pelican
Pond Heron
White Ibis
Grey Pelican
White Necked Stork

Reptiles

Indian Cobra
Water Monitor
Green Iguana
Estuarine Crocodile
Gharial
Marsh Crocodile
American Alligator
Spectacled Caiman
Rat Snake
Russell's Viper
King Cobra
Reticulated Python
Rock Python
Starred Tortoise

TRICHUR ZOO

Wild Boar
Lion-Tailed Macaque
Bonnet Macaque
Rhesus Macaque
Himalayan Black Bear
Lion
Leopard
Jungle Cat
Jackal
Small Indian Civet
Common Palm Civet
Porcupine
Hog Deer
Blackbuck
Sambar
Axis Deer
Arabian Camel
Hippopotamus

Birds

Peafowl
Rose-Ringed Parakeet
Painted Stork
Brown Fish Owl
Black Kite
Brahminy Kite
Rosy Pelican
Cormorant
Barn Owl
Mottled Wood Owl
Night Heron
White Stork
Adjutant Stork
Darter

Reptiles

Saltwater Crocodile
Gharial
Travancore Tortoise
Rock Python
Russell's Viper
Cobra
Krait
Sand Boa
Chameleon
Water Snake
Trinket Snake

TRIVANDRUM ZOO

Lion-Tailed Macaque
Bonnet Macaque
Common Langur
Rhesus Macaque
Brown Capuchin Monkey
Nilgiri Langur
Himalayan Black Bear
Sloth Bear
Giraffe
Burchell's Zebra
Lion
Leopard
Tiger
Striped Hyena
Jackal
Wild Boar
Axis Deer
Sambar
Blackbuck
Hog Deer
Barking Deer
Indian Rhinoceros
Asiatic Elephant
Hippopotamus
African Cape Buffalo
Mithun
Nilgiri Tahr
Porcupine
Indian Giant Squirrel
Indian Fox
Small Indian Civet
Jungle Cat
Common Palm Civet
Small Travancore Flying Squirrel
Nilgai

Birds

Cockatoo
Spotted Dove
Budgerigar
Rose-Ringed Parakeet
Alexandrine Parakeet
Blossom Headed Parakeet
Grey Headed Fishing Eagle
King Vulture
Cinereous Vulture
Grey Heron
Painted Stork
Common Peafowl

Common Crane
White-Necked Stork
Grey Pelican
Adjutant Stork
Brahminy Kite
Black-Necked Stork
Spoonbill
Night Heron
Herring Gull
White Ibis
Emu
Cassowary

Reptiles

Gharial
Spectacled Caiman
Monocellate Cobra
Binocellate Cobra
Trinket Snake
Russell's Viper
Ceylon Cat Snake
Golden Tree Snake
Rock Python
Red Sand Boa
Common Sand Boa
Malabar Pit Viper
Bengal Monitor
Checkered Keelback Water Snake
Green Tree Snake

VAN VIHAR NATIONAL PARK AND ZOO

Striped Hyena
Tiger
Lion
Leopard
Sloth Bear
Sambar
Axis Deer
Blackbuck
Chinkara
Chowsinga

Reptiles

Marsh Crocodile
Gharial
Gangetic Soft-Shelled Turtle

VEERMATA JIJABAI UDYAN ZOO

Asiatic Lion
Leopard
Tiger
Striped Hyena
Himalayan Black Bear
Asiatic, Elephant
Bonnet Macaque
Common Langur
Rhesus Macaque
Blackbuck
Chowsinga
Axis Deer
Nilgai
Sambar
Indian Rhinoceros
Indian Porcupine

Birds

Sarus Crane
Adjutant Stork
Emu
Pied Hornbill
African Grey Parrot
Victoria Crowned Pigeon
Hill Myna
Bhutan Grey Peacock Pheasant
Military Macaw
Alexandrine Parakeet
Brahminy Kite
Shikra
Red-Billed Blue Magpie
Common Peafowl
Budgerigar
Cockatiel
Jungle Crow
Red-Breasted Parakeet
Plum-Headed Parakeet
Greylag Goose
Mandarin Duck
Rosy Pelican
Night Heron
White Stork
White-Necked Stork
Common Crane
Black-Necked Stork
Bar-Headed Goose
Pond Heron
Purple Moorhen
Cattle Egret

Spoonbill
White Ibis
Demoiselle Stork
Cape Crowned Crane

Reptiles

Marsh Crocodile
Pond Turtle
Rock Python
Common Sand Boa
Red Sand Boa
Russell's Viper
Checkered Keelback Water Snake
Rat Snake
Bengal Monitor Lizard
Indian Cobra
Gharial

VISHAKHAPATNAM ZOO

Asiatic Elephant
Rhesus Macaque
Stump-Tailed Macaque
Sacred Baboon
Olive Baboon
Dhole
Jaguar
Puma
Leopard
Lion
Himalayan Black Bear
Sloth Bear
Wolf
Jackal
Striped Hyena
Hippopotamus
Chowsinga
Brow Antlered Deer
Sambar

Birds

Peafowl
Tawney Eagle
White-Backed Vulture
Black Kite
White Scavenger Vulture
Moluccan Salmon Crested Cockatoo
Amazon Parrot
Eclectus Parrot
Red-Winged Parrot

Blue and Yellow Macaw
Pied Hornbill
White Cockatoo
Sulphur Crested Cockatoo
Goffin's Cockatoo
African Grey Parrot
Alexandrine Parrot
Budgerigar
Hill Mynah
Rose-Ringed Parakeet
Red Lory
Rainbow Lory
Fischer's Lovebird
Blue-Masked Lovebird
Blue Peach-Faced Lovebird
Blue Cockatiel
Chinese Silver Pheasant
Golden Pheasant
Red Spur Fowl
Kaleej Pheasant
Ring-Necked Pheasant

Reptiles

Rat Snake
Rock Python
Starred Tortoise
Marsh Crocodile
Estuarine Crocodile
Gharial

WEST BENGAL SNAKE PARK

Reptiles

Black Cobra
Monocellate Cobra
Russell's Viper
Common Sand Boa
Bronzeback Tree Snake
Banded Krait

Birds

Peach Faced Lovebird
Budgerigar
Cockatiel

APPENDIX 2

Other Animal Protection Groups

All India Animal Welfare Association

Dr. E. Moses Road, Mahalaxmi East
Mumbai 400 011, Maharashtra
India

Animal Welfare Board of India

13/1, Third Seaward Road,
Valmiki Nagar, Thiruvanmiyur,
CHENNAI-600 041
India

Care for the Wild India

A-003 Radhakrishna Apartment
Opp. University, Narayan Nagar
Bhopal, 462026 (M.P.)
India

Compassion Unlimited Plus Action (CUPA)

257, Ist Cross, HAL II Stage, Indiranagar
Bangalore, 560 038 Karnataka
India

People for Animals

14, Ashoka Road
New Delhi, 110 001, Delhi
India

People for the Ethical Treatment of Animals (India)

P.O. Box 28260
Juhu, Mumbai 400 049
India

Wildlife Trust of India

A-220, New Friends Colony
New Delhi, 110 065
India



Compassionate Crusaders Trust
1/13A, Olai Chandi Road
Kolkata – 700 037
India

91 33 2532 0000 (ph)
debasischak@vsnl.net
<http://animalcrusaders.org/door.html>



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