ex-situ

UPDATES

Central Zoo Authority
केन्द्रीय चिड़ियाघर प्राधिकरण

Ministry of Environment, Forest and Climate Change

The quarterly newsletter of
the Central Zoo Authority, New Delhi
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(January - March 2022)

ZOO SAFARI

Azadi Ka Amrit Mahotsav

CZA 30

TALKING HEADS

DUBAI SAFARI PARK

JON COE | ERIK VAN VLIET

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Cover Credit:
Tiger Safari at Bengaluru Bannerghatta Biological Park, Karnataka

EDITORIAL BOARD

Member Secretary during his visit to the conservation breeding facility for Red Panda at Padmaja Naidu Himalayan Zoological Park, Darjeeling

From the desk of the MEMBER SECRETARY

The origin of the word safari is from Arabic '*safara*' meaning 'to travel'. In general, wildlife Safaris allow visitors to experience the grandeur of the natural world under controlled settings. They lead the way in ecotourism, educating people on wildlife ecosystems and how best to conserve them. While on a safari, one can observe animals and their natural behaviours from afar in the wild with minimal disturbance. Well-planned safaris can also bring the element of local culture and history into the journey.

Several zoos in India have attempted to offer this experience to zoo visitors. Safaris in zoos aims to recreate a wildlife safari experience by displaying animals in immersive naturalistic exhibits. Safari Parks are larger and more spread out, with enclosures that are more free-range so that visitors can see animals in more naturalistic settings with sympatric species together, just as they would live in their natural habitats in the wild. They offer animals more choice and the freedom to choose.

A large number of Indian zoos are increasingly moving towards establishing safaris as part of existing facilities. There are nearly 20 zoos across the country offering a hybrid experience of both safari and conventional zoo enclosures. Furthermore, several newer zoos under establishment aim to create exclusive safari experiences to visitors, moving away from the conventional zoo-design concepts.

The design of 'safari experience' within a zoo while providing a boundary-less experience requires intensive planning and execution. It is a matter of pride that the Indian zoo community is learning and advancing in conforming to these ideas in the interest of animal welfare.

Sanjay Shukla
Member Secretary
Central Zoo Authority

NEWS & EVENTS

March 9 to 11, 2022

On the World Wildlife Day 2022, the quarterly newsletter of CZA - Ex-situ Updates was released by Dr Sanjay Shukla who recently took charge as Member Secretary, CZA, also present were other staff of the CZA Secretariat.

March 9 to 11, 2022

"Capacity Building training program on Captive management of animals for the animal keepers of Southern region" at Arignar Anna Zoological Park, Vandalur, Tamil Nadu.

The workshop, through a series of expert sessions and hands-on training, provided the participants with both theoretical and practical know-how on captive animal management. The sessions covered aspects pertaining to the basic biology of species, identification and marking of species, environmental enrichment, best practices for handling animals, and animal record keeping.

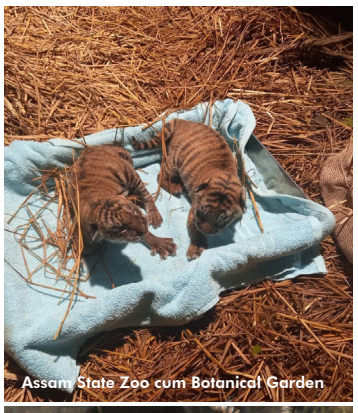
March 21, 2022

On the occasion of International Forest Day 2022, Hon'ble Minister (EF&CC) Shri. Bhupendra Yadav & MoS (EF&CC) Shri. Ashwini Kumar Choubey unveiled the CZA publication titled "Ex-situ Management of Amphibians in Indian Zoos" in an event organized by the National Zoological Park, New Delhi.

Publications

Captive Births In Zoos

This quarter recorded the births of several species of endangered Indian wildlife housed in various zoos. Some noteworthy captive births were: Bengal Tiger, Gee's Golden Langur, Indian Wolf and Blackbuck.


Assam State Zoo cum Botanical Garden


Assam State Zoo cum Botanical Garden

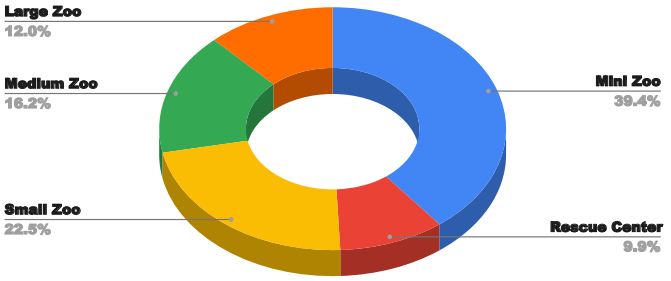

Assam State Zoo cum Botanical Garden


Sajjangarh Biological Park, Udaipur

30 years

Central Zoo Authority

Text:
Editorial Team, CZA



Zoo Category chart

On February 6, 2022 the Central Zoo Authority has completed 30 years since its contitution in 1992. It is a statutory body of the Ministry of Environment, Forest and Climate Change, Government of India. It was established to groom Indian zoos to be premium ex situ facilities with established linkages to in situ conservation. The mission is to facilitate and advance professional animal management practices in Indian zoos through technical cooperation and to empower zoos with the necessary capacity to promote awareness and further the conservation of threatened Indian wildlife. This is executed through policy-level decisions to regulate functioning of Indian zoos. As of December 2021, there are 147 zoos in the country recognized by the CZA under the Section 38 H (1) of the Wild Life (Protection) Act, 1972.

During the 30 years following its constitution the CZA has spearheaded advancement of Indian zookeeping through policy decisions and technical co-operation. To this end CZA has formulated various rules and guidelines to promote scientific management of animals in zoos and effectively advance the science of ex situ conservation. The key ones being National Zoo Policy (1998), Recognition of Zoo Rules (2009) and Guidelines for the establishment and scientific management of zoos in India (2008). In addition to these notifications, circulars are timely issued by CZA on specific aspects of zoo management, housing guidelines and tackling unprecedented scenarios like COVID-19 pandemic.

Zoos in India are governed under the provisions of the Wild Life (Protection) Act, 1972, and various guidelines formulated by the CZA. In addition to statutory

Transformation of housing facility for Asiatic Lion enclosure from a menagerie to naturalistic open enclosure at Sri Sayajibaug Zoo, Vadodara, Gujarat

functions, the CZA also provides financial assistance to conservation breeding programs and infrastructural upgradation in zoos. Recognising the need for the conservation of the threatened species, the Central Zoo Authority has identified 74 species of indigenous fauna for focused conservation breeding which includes 46 mammals, 24 aves, 3 reptiles and 1 amphibian species.

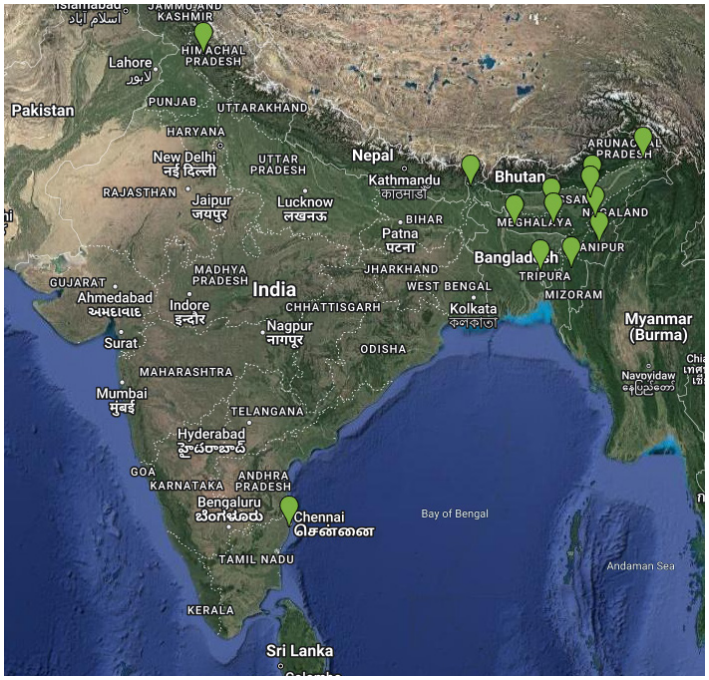
As outlined in the National Zoo Policy, in addition to displaying animals, conservation breeding of threatened species, zoos also function as rescue centres. Additionally, there are 14 exclusive Rescue Centres in the country recognized by the CZA.

The CZA fulfilling its statutory functions remarkably led to the advancement of zoo science in India. A Vision Plan 2021-31 has been prepared by CZA as a guiding document to achieve the transformation of Indian Zoos to global standards.

AZADI Ka Amrit Mahotsav

Conservation to co-existence: The People Connect

January 1st - March 31st 2022



The outreach campaign, Conservation to Co-existence: the people connect was initiated by the Central Zoo Authority as part of the Azadi ka Amrit Mahotsav celebrations. The aim is to create awareness about the natural history of 75 conservation priority species and 75 zoos across India.

The campaign has completed 55 weeks as of March 2022 with over 1900 hours of outreach activity. Public engagement was taken up by the zoos in focus every week with guided tours, rallies, marathons, expert talks, awareness drives, and different competitions.

The 'Know your species, Know your zoo' talk organized by the CZA Secretariat every Wednesday has covered 55 species of conservation priority across 8 biogeographic zones.

In totality, so far 110 speakers (Subject experts and Officer-in-charge) have delivered talks on the species biology, their natural history along with information on the associated zoos. The previous issues of the newsletters included information on the talks held from week 1 to 42.

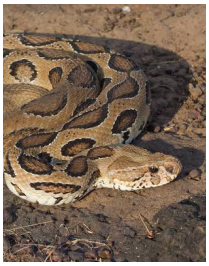
Compiled by:

Arundhati Mohanty

Senior Research Fellow, CZA.

Photos: Credit to the rightful owners for pictures used.

Russell's Viper (*Daboia russelii*) and Chennai Snake Park, Chennai, Tamil Nadu

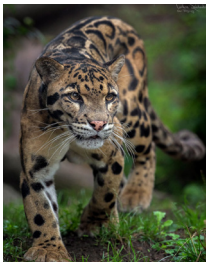


The talk gave an overview of species identification, behaviour, and snakebite management protocols. Research activities undertaken by the zoo were highlighted.

Dr Abhijit Das,
Scientist-D, Wildlife Institute of India, Dehradun, Uttarakhand
Dr S.R. Ganesh,
Deputy Director, Chennai Snake Park, Tamil Nadu

Week 43

Clouded Leopard (*Neofelis nebulosa*) and Sepahijala Zoological Park, Tripura.



The talk covered rescue and rehabilitation protocols for the species in focus. The history, amenities and future plans of the zoo were also covered.

Dr Bhaskar Choudhury,
Wildlife Veterinarian, Wildlife Trust of India
Mr M. Venkateswaran IFS,
Director, Sepahijala Zoological Park

Week 44

Pygmy Hog (*Porcula salvania*) and Assam State Zoo cum botanical garden, Guwahati, Assam.

The talk discussed ex-situ conservation initiatives undertaken for the species with an overview of the zoo and its conservation breeding facility.

Dr Parag Jyoti Deka,
Programme Manager, Aaranyak
Dr Ashwini Kumar, IFS,
Director, Assam state zoo cum botanical garden

Week 45

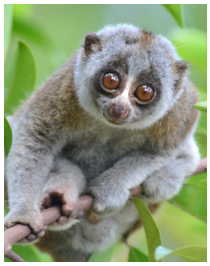
Northern Pig-tailed Macaque (*Macaca leonina*) and Aizawl Zoological Park, Mizoram.

The talk covered the action points for the conservation of species with an overview of the zoo and its infrastructure.

Dr Dilip Chetry,
Scientist-E, Head, Primate Research and Conservation Division, Aaryanak
Mr Lalunzira, IFS,
Officer-in-charge, Aizawl Zoological Park, Mizoram

Week 46

Slow Loris (*Nycticebus bengalensis*) and Nehru Park Zoo, Tura, Meghalaya.



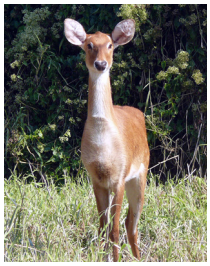
The talk discussed the ecology and conservation status of the species in India with special reference to the North-east region with a virtual tour of its infrastructure and future plans.

Dr Nabajit Das,
Assistant Professor, B.H College, Assam

Dr Sengpat Momin,
Veterinary Officer, Meghalaya Forest Department

Week 47

Sangai (*Rucervus eldii eldii*) and Manipur Zoological Garden, Manipur.



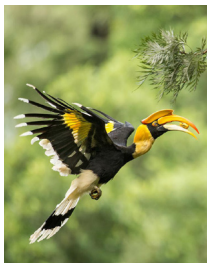
The talk discussed the ecology and conservation status of the species along with the vision, activities undertaken and efforts made for ex-situ conservation of the species.

Dr Chongpi Tuboi,
Project Scientist, Wildlife Institute of India, Dehradun

Dr Laishram Sarat Chandra Singh,
Veterinary Officer, Manipur Zoological Park

Week 48

Great Hornbill (*Buceros bicornis*) and Mini Zoo, Roing, Arunachal Pradesh.



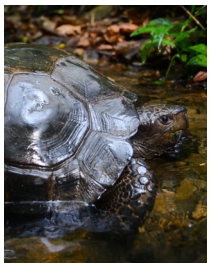
The talk detailed the natural history of the species and the role they play as the gardeners of the forest with a brief overview of the zoo and activities conducted.

Ms Pooja Pawar,
Research Affiliate, Nature Conservancy Fund

Mr Mori Riba,
DFO and Officer-in-charge, Mini Zoo, Roing

Week 49

Asian Brown Tortoise (*Manouria emys*) and Lady Hydari Park cum Mini Zoo, Meghalaya.



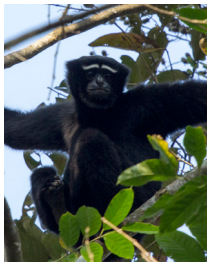
The talk covered the initiatives undertaken for the conservation of the species along with future plans of the zoo.

Ms Arpita Dutta,
Consultant, Turtle Survival Alliance-India Program

Mr Sachin Shankar Gavade, IFS,
Officer in charge, Lady Hydari Park cum Mini Zoo

Week 50

Western Hoolock Gibbon (*Hoolock hoolock*) and Biological Park, Itanagar, Arunachal Pradesh.



The biology of the species, its conservation status, and an overview of the zoo's amenities and conservation breeding program were covered in this talk.

Dr Narayan Sharma,
Assistant Professor, Cotton University.

Dr Sorang Tadap,
Veterinary Officer, Biological Park, Itanagar

Week 51

Blyth's Tragopan (*Tragopan blythii*) and Nagaland Zoological Park, Nagaland.

The talk discussed the findings from research on the species, its conservation status, and the protocols established for the ex-situ breeding of the species in the zoo.

Dr Rahul Kaul,
Chief Executive Officer, Wildlife Trust of India

Dr C. Zupeni Tsanglai, IFS,
Director, Nagaland Zoological Park

Week 52

Greater One-horned Rhino (*Rhinoceros unicornis*) and Centre for Wildlife Rehabilitation And Conservation.

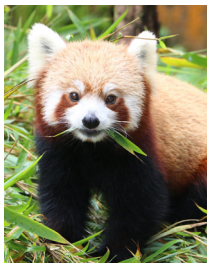
The talk covered the population status of the species at key sites of its distribution along with wildlife rescue and rehabilitation efforts of the CWRC in Assam.

Dr Bibhab Kumar Talukdar,
Secretary-General and Chief Executive Officer, Aaryanak

Dr Bhaskar Choudhury,
Head (Rescue) and Wildlife Veterinarian, WTI

Week 53

Red Panda (*Ailurus fulgens*) and Padmaja Naidu Himalayan Zoological Park, West Bengal.



The talk primarily discussed the in-situ and ex-situ initiatives being undertaken for the conservation of the species and its findings.

Dr Sunita Pradhan,
Wildlife Biologist, Ashoka Trust for Research in Ecology and the Environment

Dr Basvaraj S. Holeyachi, IFS,
Director, Padmaja Naidu Himalayan Zoological Park

Week 54

Himalayan Tahr (*Hemitragus jemlahicus*) and Dhauladhar Nature Park, Himachal Pradesh.

Species ecology, resource partitioning, and threats to the population of the species along with the conservation and management activities taken up by the zoo were covered in this talk.

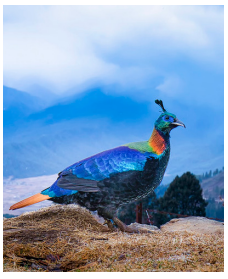
Ms Ranjana Pal,
Project Associate, Wildlife Institute of India, Dehradun

Mr Rahul Rohane, IFS,
DCF (Wildlife) and Director, Dhauladhar Nature Park

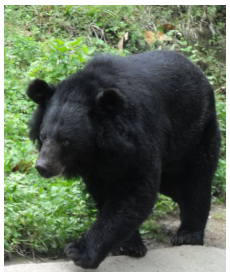
Week 55

Upcoming Weeks

Week 56



Week 57



Week 58

ZOO SAFARI

Text:
Editorial Team, CZA

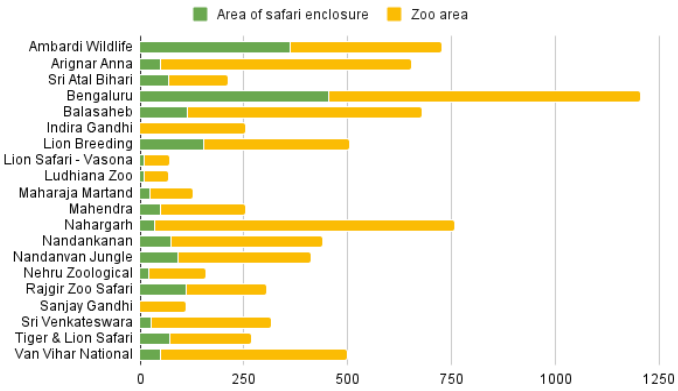
Zoo safaris refer to drive-through fenced enclosures housing animals in relatively large naturalistic spaces. The visitors are often driven through a safari in an enclosed vehicle to view the animals. Most existing zoos incorporate safaris as an addition to existing facilities. They offer dynamic viewing experience to the visitors. There are also several new establishments coming up with exclusive safari enclosures. These attractions allow the animals more space than the small enclosures of traditional zoos.

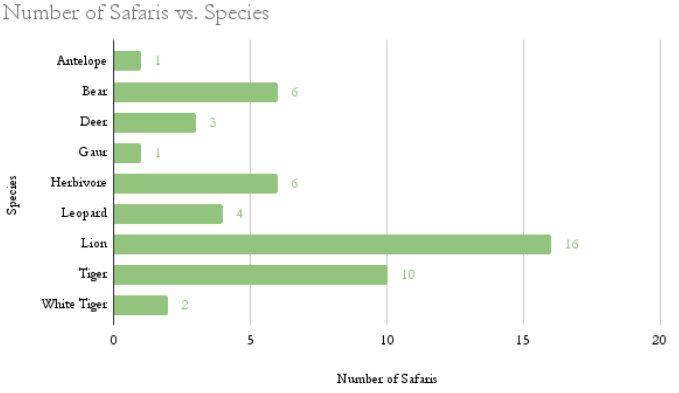
The Central Zoo Authority has prescribed a minimum area of 30 hectares and 20 hectares for outdoor enclosures for herbivore and carnivore safari respectively. The Guidelines for the Establishment and Scientific Management of Zoo (2008) identifies safaris as 'specialised animal display' and provides norms for their development and operation.

Currently, there are 20 recognised zoos across India with safari enclosures including Rajgir Zoo Safari, which exclusively has safari enclosures. They majorly display large carnivores such as Bengal Tiger (*Panthera tigris*), Asiatic Lion (*Panthera leo ssp. leo*), Sloth bear (*Melursus ursinus*) and large/medium sized herbivores such as Spotted Deer (*Axis axis*), Sambar (*Rusa unicolor*) and Indian Gaur (*Bos gaurus*).

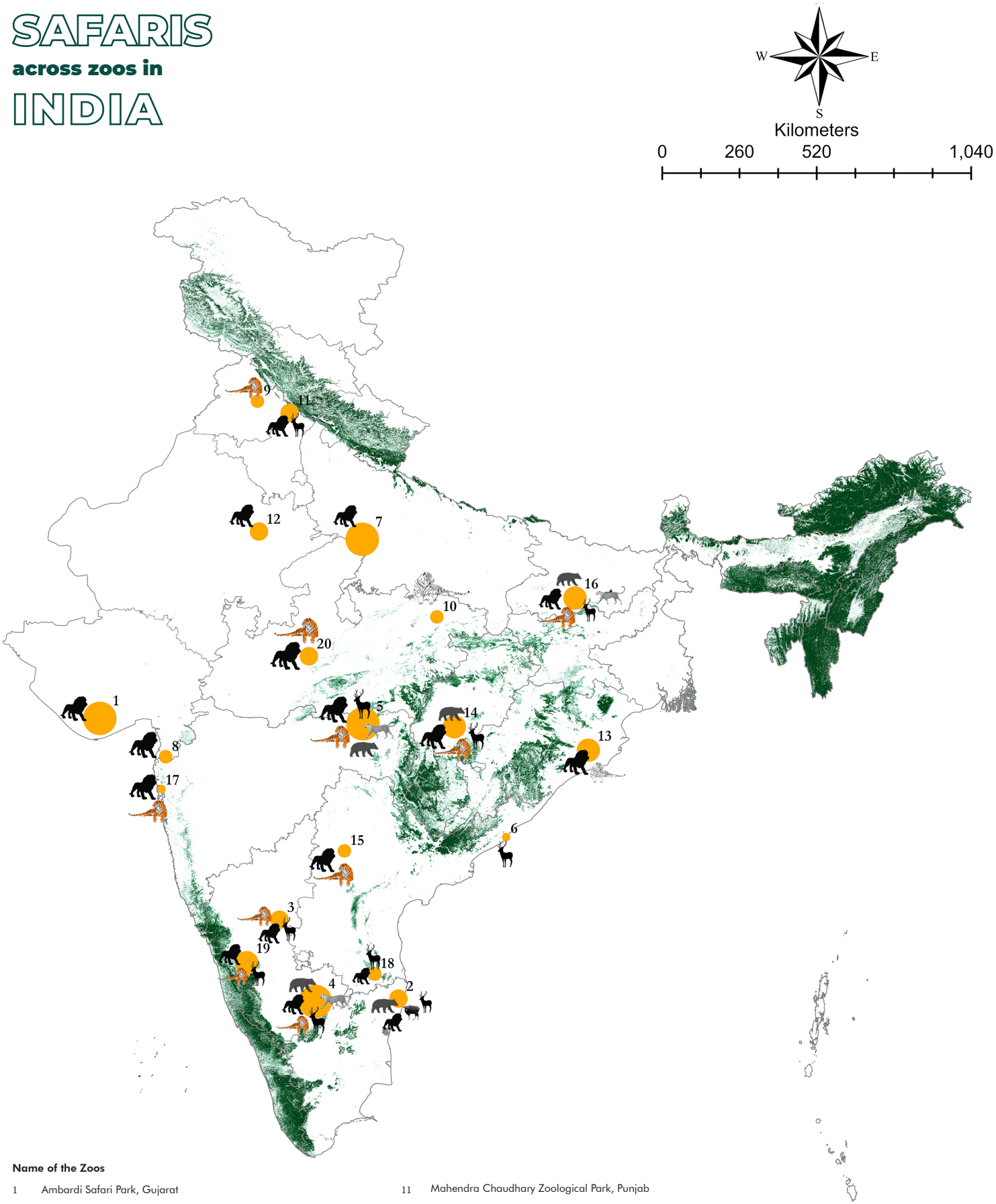
In zoos with both safari and traditional display enclosures, safari area comprises of up to 30% of the total zoo area.

Safaris in zoos offer a distinctive experience of viewing animals as though in nature, relative to seeing them in smaller enclosures.





SAFARIS
across zoos in
INDIA



Name of the Zoos

1	Ambardi Safari Park, Gujarat	11	Mahendra Chaudhary Zoological Park, Punjab
2	Arignar Anna Zoological Park, Tamil Nadu	12	Nahargarh Biological Park, Rajasthan
3	Sri Atal Bihari Vajpayee Zoological Park, Karnataka	13	Nandankanan Zoological Park, Odisha
4	Bannerghatta Biological Park, Karnataka	14	Nandanvan Jungle Safari, Chhattisgarh
5	Balasaheb Thackeray Gorewada International Zoological Park, Maharastra	15	Nehru Zoological Park, Telangana
6	Indira Gandhi Zoological Park, Andhra Pradesh	16	Rajgir Zoo Safari, Bihar
7	Lion Breeding Centre and Multiple Safari Park, Uttar Pradesh	17	Sanjay Gandhi National Park & Zoo, Maharastra
8	Lion Safari - Vasona, Dadra and Nagar Haveli and Daman and Diu	18	Sri Venkateswara Zoological Park, Andhra Pradesh
9	Ludhiana Zoo, Punjab	19	Tiger & Lion Safari, Karnataka
10	Maharaja Martand Singh Judeo White Tiger Safari & Zoo, Madhya Pradesh	20	Van Vihar National Park Zoo, Madhya Pradesh

Safaris

- Lion Safari
- Tiger Safari
- Bear Safari
- Deer/ Herbivore Safari
- Gaur Safari
- Leopard Safari
- White Tiger Safari

Area of Safari in Ha.

- 0.01 - 27.20
- 27.20 - 70.00
- 70.00 - 112.80
- 112.80 - 455.26

SAFARI

BENGALURU BANNERGHATTA BIOLOGICAL PARK, KARNATAKA

Text & Photos:
CCF & Executive Director,
Bengaluru Bannerghatta Biological Park,
Karnataka.

Bengaluru Bannerghatta Biological Park, Karnataka (BBBP) is located about 22 km from Bengaluru city. It is a locale where wilderness is preserved close to a metropolitan city. BBBP's mission and vision are ex-situ conservation through wildlife protection and preservation for the present and future generations to come.

It was started as a picnic spot within Bannerghatta National Park (BNP) in the early 1970's and was later bifurcated from BNP and brought under the administrative jurisdiction of the Zoo Authority of Karnataka (ZAK). The landscape is a representation of the adjoining dry deciduous and moist deciduous forests of the Bannerghatta national park. It is home to a wide variety of fauna which are often spotted within the BBBP range as well.

Currently classified as a large zoo, BBBP consists of conventional displays, a Safari, a Butterfly Park and an off-display Rescue Centre within an area of over 730ha and houses more than 2000 animals belonging to around 100 species of birds, mammals and reptiles.

The safari is the most sought after by visitors, both from within and outside India. The visitors get to learn and explore the safari in protected, closed buses and

jeeps provided by the zoo in partnership with the Karnataka State Tourism Development Cooperation (KSTDC). An audio guide is also available for visitors in English and Kannada to get further insights about the safari and to learn about the resident animals.

The safari tour starts at the Herbivore Safari which is 68 Ha and barricaded by a rubble wall. It is a mixed species safari with Spotted Deer (*Axis axis*), Sambar Deer (*Rusa unicolor*), Nilgai (*Boselaphus tragocamelus*), Gaur (*Bos gaurus*) and Black buck (*Antilope cervicapra*). Various feeding units are located along the safari roads to give visitors a glimpse of the different herbivore species in their near natural habitat. The herbivores can also be spotted at one of the five, interconnected natural lakes. These water bodies fill up during the rainy season and sustain even during summer. Sambar can be spotted in the middle of the lakes, feeding on freely available grass and during summers they can be spotted in naturally formed slush ponds drenching themselves to keep cool. During the mating season of the Gaur, their vocalisation can often be heard by the visitors; a definite value addition to the experience. Frequently, young of Spotted Deer, Sambar and Gaur may be spotted in the safari as they breed well within this area.

After the herbivore safari, visitors get a glimpse of the natural forest, before they reach the sloth bear safari. Signs of captive Asian Elephants (*Elephas maximus indicus*) are evident along this patch with dung, broken twigs or leaves scattered on the roads and signs of feeding from tree bark.

The Bear Safari is home to around 64 rescued Sloth Bears (*Melursus ursinus*), out of which the majority were previously used as "dancing bears" by the Kalandar community. Some have been rescued from human-animal conflict situations or found as abandoned cubs. This 20 hectare safari area is protected by a dry moat along with a solar fence all around and a double gate system to prevent the sloth bears from escaping.

The bears roam freely within this area during the day in compatible groups. Watermelon, honey and other seasonal fruits are scattered in the field during afternoons to encourage foraging behaviour and the habitat allows for exhibition of natural behaviour like digging the soil to feed on termites. Natural burrows have been created by the bears, where they rest during the hot time of the day and return back to their individual holding houses for the night.

A soon to be added attraction is the leopard safari, which is currently under construction. Bannerghatta is home to a good population of free ranging Leopards (*Panthera pardus*) and highlighting these top predators is vital through the display of captive leopards in this safari unit for visitors to learn about these elusive big cats.

The carnivore safaris are surrounded by chain-link mesh, moat and railway lines used as barricades along with a double gate system for entry and exit.

The Lion safari is home to 21 Lions (*Panthera leo*) and the prides are grouped according to compatibility. They are allowed in the safari on a rotational basis and visitors get a glimpse of these majestic animals interacting and resting close to the natural lake between bamboo clusters.

The safari housing Leucistic Tigers (*Panthera tigris ssp tigris*) has a water pond, resting platform and trees. The Tigers use these for scent marking. The last section of the safari houses the Tigers (*Panthera tigris ssp tigris*), either a breeding pair or two brothers from the same litter. This species is generally solitary in the wild. They camouflage extremely well in the long grass, bamboo breaks and there is excitement while searching for these endangered big cats within the safari area. They can be spotted scent marking, clawing trees, resting in water or between grass and occasionally surprise visitors with close encounters next to the safari vehicles.

Visitors get a glimpse of the Lungs of Bengaluru

"Bannerghatta National Park" while returning from the tiger safari. Bannerghatta Biological Park is carved out of the National Park and it is the northernmost tip of the Mysore Elephant Reserve.

This vital corridor for elephants and other wildlife has an undulating terrain with broken chains of hills and rocky outcrops. Existing rocks are made of coarse granite and complex gneiss, which are part of Peninsular gneiss. Since vegetation in the biological park is similar to that of the National Park, some of the commonly found tree species are Peepal, Indian fig tree, neem, gooseberry and a shoka. According to Champion and Seth's classification of Indian forests, the upper region has southern tropical dry deciduous forests in red and gravelly soil and the valley region has southern tropical moist deciduous forests in sandy loam soil.

All the animals in the different safari units are monitored by their keepers for any signs of ill health and the same is reported to the veterinary team, headed by the Assistant Director of Veterinary Services. Feeding of all carnivores is done indoors in the holding house. The maintenance of the safari infrastructure is a team effort and the Range Officers, Keepers and security personnel assess the integrity of the mesh and doors twice a day. Staff are deployed around the clock to monitor the safari animals. Before the onset of the dry season, weeding and fire lines are created within the safari range to prevent the spread of forest fires under the watchful supervision of the Range Forest Officers. Additionally, people from the indigenous communities in the region such as the jenu kurubas and iruligas are employed and play a vital role in ensuring safety at night. The safari is a complete experiential learning model for visitors who can explore the wilderness and learn about captive wildlife in near natural habitats. The aim is that all the visitors leave with the motivation to protect species and habitats and to adopt green life styles and do their bit for nature and wildlife conservation.

SAFARI

NEHRU ZOOLOGICAL PARK, HYDERABAD, TELANGANA

Text & Photos:
Curator,
Nehru Zoological Park,
Hyderabad, Telangana.

The Nehru Zoological Park, Hyderabad was inaugurated on 6th October 1963 after the relocation of the enclosures from the Public Gardens, Hyderabad. The Nehru Zoological Park, Hyderabad over 150 hectares, adjoining a nearly 243-hectare waterbody called the Mir-Alam Tank. This waterbody attracts hundreds of migratory birds, providing an additional attraction to the zoo. Nestled in the boundary hills of the Deccan Plateau, the undulating landscape, makes Nehru Zoological Park, a premier destination in Hyderabad, for the locals, visitors and wildlife enthusiasts. The zoo houses close to 2044 individuals of over 192 species, of mammals, birds, reptiles and amphibians.

Nehru Zoological Park, Hyderabad is one of the first zoos in the country to conceptualise a natural Safari and established the Lion Safari Park in 1974 extending over an area of 16.19 hectares. This has been upgraded to a Safari Complex adding a Tiger Safari with an area of 14.164 hectares. It was inaugurated in 1988. The Bear Safari and Gaur Safari were inaugurated in 1992.

The tourists are taken through the Lion Safari, Tiger Safari, Bear Safari, Gaur Safari and Nilgai Safari in CNG buses.

The near-natural environs of the safari showcase a

diversity of flora and fauna. The area of the Safaris is covered with a green canopy, rocky hillocks, shrub forests and perennial water flows that connect the safaris to the Mir Alam tank.

The major floral assemblage of the Safari Park consists of *Azhadirachta indica* (Neem), *Tamarindus indicus* (Tamarind), *Ficus religiosa* (Peepal), *Ficus bengalensis* (Banyan), *Ficus glomerata* (Red River Fig), *Albizzia lebbek* (lebbek tree), Acacias, *Santalum album* (Sandalwood), *Wrightia tinctoria* (dyer's oleander) etc.

The free-ranging fauna of the area is Spotted Deer, Indian Mongoose, Bengal Monitor Lizard, Indian Palm Civet, Black-naped hare, Three Striped Palm Squirrel etc. Besides mammals, there are colourful species of Deccan dry deciduous forest avifauna like Indian Peafowl, Grey Francolin, Partridges, Quails, Storks, Herons, Doves, Bee-eater, Indian Roller, Sun Birds, Flowerpeckers, Hoopoe, Wagtail, Magpie- Robin, Bulbul, Babbler and Ducks etc. Herpetofauna includes Rock-agama, Common Garden Lizard, Grass Skink, etc.

VAN VIHAR NATIONAL PARK AND ZOO, BHOPAL, MADHYA PRADESH

Text & Photos:
Director,
Van Vihar National Park Zoo,
Bhopal, Madhya Pradesh.

The Van Vihar National Park & Zoo was conceptualized as a "safari" experience in the natural environs of Bhopal, the state capital of Madhya Pradesh. The habitat, on the eastern bank of the upper lake which is also a Ramsar site, is conducive for the wild carnivores of Central India.

Van Vihar was established on October 2, 1981 and was officially notified as National Park on January 26, 1983. On November 24, 1994 the Central Zoo Authority recognised Van Vihar as a medium-size Zoo. spread over an area of 445 hectares. Nearly 6 lakh visitors come to Van Vihar National Park and Zoo every year.

Since its inception, Van Vihar National Park and Zoo has set an example of eco-restoration. The Van Vihar National Park and Zoo area is 65% hilly and 35% plains. The land patterns and the varied soil types, from sandstone to rich black cotton soil near the lake, allow for the diverse vegetation types to flourish. There are 67 tree species, 37 types of shrubs, 30 varieties of grasses and rich aquatic flora documented in the area.

Van Vihar National Park and zoo has a unique theme and displays carnivorous species like the Lion, Tiger, Leopard, Hyena and Golden Jackal. The herbivores are mainly free ranging and there are more than 1400 individuals of Sambar, Spotted Deer, Blackbuck, Bluebull, Chowsingha, Chinkara and Barasingha. There are 266 species of birds, both migratory and resident, 23 species of reptiles and 41 species of butterflies recorded in zoo premises.

From the management point of view, the area is divided into free-ranging animal zone, captive-animal zone, an administrative zone, a tourism zone and a geriatric animal zone. The National Park and Zoo is managed by three units headed by Range Officers: animals in enclosures are overseen by the Safari unit, the Tourism unit takes care of the gates and visitor amenities, and the Management unit oversees the day to day management of the Park.The Director is in the rank of Chief Conservator of Forests. The Assistant Director oversees the functioning of the whole facility. There is a veterinary section, headed by a Veterinary Officer, with a well- equipped hospital, indoor and outdoor patient care wards and a quarantine area. The night security team is headed by a Range Officer. The tourism zone of Van Vihar extends from gate no. 1 to gate no. 2 comprising of an viary, Gharial-Mugger enclosures, a transit centre for snakes, Bird-Butterfly Interpretation centre, Turtle-Tiger trail, Leopard- Sloth Bear- Lion-Indian Gaur- Golden Jackal and Hyena enclosures.

Tourists have always been drawn to the experience of a jeep safari in the national park and the Van Vihar management started a Wildlife Day safari on October 2, 2014. The enclosures have been given names and people identify with the locations on repeated visits. There are two routes for the safari which can start from either of the two entry gates, Ramu dwar gate no.1 or Cheeku dwar gate no.2 and end at the other. Van Vihar has four Interpretation centres namely Vihar Vithika (Birds Butterflies and Snakes) where the history of Van Vihar, general information on wild animals, local migratory birds, butterflies and Snakes is displayed.

The Open Aviary is near Cheeku dwar where the local and migratory species of birds are often seen. The species that can be spotted are Egrets, Herons, Teals, Cormorant, Kingfisher, Painted stork, Black-winged stilt, Spot-billed duck, Moorhen etc. The Gharial - Mugger enclosure is adjacent to the aviary and there are four ponds of Mugger and Gharial where the tourist can often see them basking.

The Van Vihar National Park and Zoo has a population of free-ranging herbivores that can be spotted by tourists. Before the establishment of Van Vihar there were three villages - Prempura, Dharampuri and Amkheda in this location. People of these villages worshiped three sacred places i.e. Pahadi baba, Heeraman baba and Shakti Mata. The Van Vihar National Park and Zoo management have retained the sanctity of these places. Pahadi baba is the highest point at. 584 meters above MSL. This is the most attractive point and tourists can see the beauty of Bada Talab, get glimpses of Dronanchal- Manuabhan Hill - The Two Minars of the Tazul Masajid Mosque, the Raja Bhoj Setu and the scenic hillocks of Man museum can also been seen from here.

The Pagoda Valley gorge has a waterfall during the rainy season at this location which is popular among the visitors, it also offers an amazing view of the Bada talab. From the pagoda, the safari reaches gate no.1, Ramu dwar, and from here Takia tapu-Boat club and Raja Bhoj Setu can be viewed.

TALKING HEADS

Jon Charles Coe

Landscape Architect & Zoo Designer,
Jon Coe Design Pty Ltd,
Healesville, Victoria, Australia

What kindled your interest in zoos and zoo designing?

In the mid-1960's, while I was searching for a potential thesis topic for my master's degree in landscape architecture at the Harvard University, graduate school of design, I visited an old zoo in Boston for an art class. I heard a terrible commotion in the elephant house and when I went to see what was happening, I saw three elephants, they were chained and were fighting. They were aggressive but they couldn't quite reach each other because they were chained.

Seeing that the zookeeper wasn't trying to mitigate the situation I asked them, *why are they fighting*, to which he replied, that it was because *they are chained*, and I asked *why are they chained*, to which he said, *it was because they fight*. That was the instant when I decided to choose 'animal behaviour and zoo improvement' as my thesis topic. During my thesis, I realised that this inter-disciplinary subject covers all my interests, including animal welfare, wildlife ecology, ancient cultures, bioclimatic regions of the world and horticulture.

It was nearly 7 years later after I graduated, I was commissioned to design a zoo. I found my interest in behavioural psychology and positive welfare through community-based solutions. In addition designing zoos I have helped design probably 5 National Parks in 4 different countries around the world. I also worked with United Nations Environment Programme to help mountain villages in Afghanistan to become self-sufficient. I am very interested in working with indigenous communities, and tribal communities and seeing their landscape as well.

Do you have any interesting anecdotes of your zoo designing experiences in India?

My first work experience in India was in 1994, when I was commissioned for designing a private zoo in the Western Ghats by a wealthy family in Coimbatore. The site was beautiful and was formerly a forest but had degraded due to grazing by the local tribal community. I helped them prepare a master plan for the zoo and a botanical garden which would have re-forested the whole site and made it a native animal zoo. The reafforestation work was taken up eventually, while the establishment of the zoo did not materialise. They hired members of the tribal community to carry out planting, weeding and maintaining of the re-forestation. This resulted in creation of employment opportunities and benefit from many programs to the tribal communities.

I was also invited by the Central Zoo Authority to deliver lectures at a conference in 2006, zoo directors' training held in Hyderabad in 2011 and New Delhi in 2012. I had a chance to interact with the officials of the Central Zoo Authority and training programs were quite comprehensive.

In 2012, I helped in preparing the master plan for Thrissur Zoological Park, Kerala. For this project, I collaborated with an Indian architectural landscape firm 'Ideas design' lead by a couple with good understanding of ecological basis to design and their willingness to take risks working on a huge government project. The project was very promising because of the support from government officials and the master plan was eventually approved by the Central Zoo Authority.

Can you elaborate on the "Unzoo" concept of Zoo designing? How does it fit into the design of Zoo Safaris?

In my paper, Third Generation Conservation, I envision a world with humans living harmoniously with nature and animals, as prevalent with traditional cultures. The industrial cultures have become more aggressive and consumption-oriented, and that resulted in more zoos, sanctuaries, and reserves. This is the background of the Unzoo alternative and Third Generation Conservation alternative, which are the ends of the spectrum. If we can give the animals more control and choice in the zoo, that could lead to a time where they can have more control and choice in the wild when are eventually rehabilitated.

The first generation of conservation is protection preservation, where you install fences to keep some things in and some things out, it sure does save a lot of species but led to the relocation of the native tribes of that region. The other limitation is that in case of species that cannot readily adapt to climate change, it limits their migration.

The second-generation conservation is restoration, where you reclaim land, marshes, wetlands, strip mines etc, and they have a positive effect. I support them. Again, the limitation is that they are boundary-fixed, they end up being preserved when finished. The way forward is the third-generation conservation, which I call accommodation. It's just living with animals all around us and making room for them and vice versa. Now, all of these things already exist, but we haven't identified them yet. So, when we have people paying 100 dollars to get on a boat to watch whales swim by, and the money that you have spent is for whale conservation, that's accommodation, that's the Unzoo at the regional scale.

For instance, here on Australia's Philip Island, there are wild penguins that come ashore every night and have burrows/ nests/ dens all around the hillside. They were being killed by foxes, other introduced species and also by people building their summer homes. So, a private group with the government's help created this programme, where people can come, pay a modest entry fee and watch the penguins, walk up the bird walk and see them all around, without bothering them. The money is used for preserving them, in their natural habitat, and that's a non-consumption

conservation programme. There's another example of accommodation, where people just put bird feeders and plant trees for the native wildlife.

The Unzoo is based on a couple of important premises, one is that even in the best zoos in the world, the zoo animals are constrained by captivity and coercion, no matter how good the exhibit is. Until recently, in many parts of the world, the captive animals were forced to do things to be on display for the visitors. But now we have this thing called positive reinforcement training, where the animal becomes a partner with you, for their well-being.

The whole design of the animal management system has changed. If you no longer need coercion, then what about captivity? And again I say, freedom is a matter of choice and control. So the first thing you do is to give them a lot more choice and control. Like, touch screen control for primates.

The second idea of the Unzoo is to contain people and not animals. Maybe the animals are still contained but in a large area, like a safari. I have been on a few safaris in Africa, and have led one for the Toronto Zoo. The safari park is an Unzoo.

The concept of Unzoo is a dream, vision, mission, it doesn't fully exist yet and it's going to be very easy for some small native animals that are there anyway, like the free-ranging species in zoos. It's going to be harder for tigers and bears. But that does not mean we should not go down that path. Let's start with animals that it will work with, learn and progress through this, maybe later with larger spectrum of taxa.

Can "Storyline-Based design" be integrated as a part of the planning of a zoo safari? What are your views on the scope for "Cultural Integration in zoo designing" in the Indian context? How relevant would it be to take this as a theme for upcoming zoos/ zoos in their transformational phase?

In the Bali Safari that I have designed, it is set up on the idea that you have come to Bali or you live in Bali, you are visiting a magical place. Between the mountain and the sea, there are magical hot springs and because it's a volcanic island, the plants and animals thrive. This magical setting and religious beliefs led to the construction of a monastery, a village with a market and entertainment areas to serve the needs of the pilgrims. All these grew around the magical hot springs. In the olden days, the monks would go to the catacombs and meditate. There is a 2000 seat theatre, where they recreate the Ramayana story on the stage in a magnificent production.

Indonesian architecture is integrated in the form of stepped courtyard style, with gardens and pavilions. The availability of traditional craftsmen to build was an added advantage for this project. A rice temple was built by the traditional craftsmen inside the premises and is accessible for prayers and offerings by the locals.

You take a tram and the first thing you see is the native animals of Indonesia, then the native India, Africa and then Bali. It's kind of like a sequential world tour and the guides are well trained. They also have a night safari, where they take the opposite route and are allowed to feed animals from the safari vehicle through a double barrier roof. The trucks have soft white light and can be focused at the desired location to view animals, and it avoids prolonged exposure to lights at night.

How can a zoo safari (Eg: Single species safari) be more engaging while imparting nature education?

In any form of education, it is important to understand that emotion comes first. The Melbourne Zoo and the zoos in Australia have come up with an education theme called "Connect, Understand, Act". First, you connect and then there is emotion involved, so you are suddenly interested and then you want to learn more. And the other thing is the things you learn and will

connect to that positive emotion.

In my work, when I hold a workshop, I always ask the client what is their message, that they want to convey through building the enclosure. So, when I help design the Taronga Zoo in Sydney, we came up with the idea that the visitor would enter the exhibit by going into an artificial aeroplane, looking out the windows which are TVs, flying over various land converted, then you would go in and see the tigers both in a wild setting and in an exhibit that is designed to look like a factory where they process palm oil, only the tigers have taken over it now and living there. That's what you call a Story-driven design and the idea is, that your message is the action you want. You cannot force-feed information, you have to present it in a way that people would enjoy learning. Keeper talks are one of the best ways to educate people visiting zoos. When passionate keepers give a talk, people feel that passion, there is the idea of authenticity.

What would you suggest as an alternative design strategy in places where the "Landscape/ Habitat Immersion", using elements of natural habitat, for a specific species is difficult to recreate.

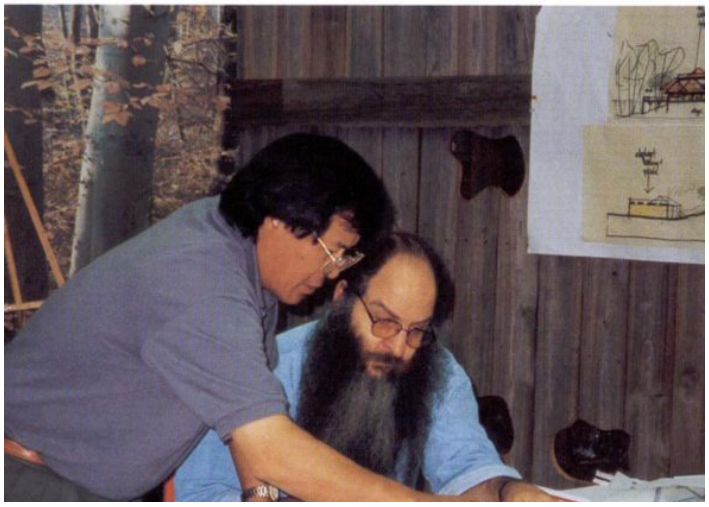
At the very beginning of planning, it is important to be realistic about what you can achieve. In a zoo, compared to Safari parks, Orangutans and Elephants are impossible to exhibit in a naturalistic immersion exhibit, because they will tear it apart, it's their nature. In the case of Urban zoos with wide pathways and big crowds, they have restrictions in terms of the availability of space for nature immersion both for animals and visitors. The other thing I have discovered about Naturalistic immersion is that it works best with a culture called a 'conservation consciousness'. There are two options to go about the naturalistic immersion design, one is what I call 'Cultural immersion', where nature and people get along.

The other is 'Functional naturalism', which is a way to say that we are providing homes for animals in a highly artificial setting, instead of having real trees to climb and swing, we have ropes and scaffolding to climb all over, the animals are just as happy. Here we can improve further by introducing innovative technologies like touch screen computers for primates, etc. The story then instead could say this is how we provide optimal well-being to the animals in our care, it's really an important idea.

In your opinion, which are some of the well-planned safaris across the world?

The two best safaris I know of, and the first one I have designed myself is called the Northwest Track. It's in the mountains of Washington State, and it's a giant enclosure of native animals of that area. It's got deer, elk, mountain goats and big-horned sheep, and doesn't have any predators. These animals were already there as a private collection, so I studied where the animals like to be and then planned a road through the safari. It was coherent and simple, it's the obvious thing to do.

The other best one was exactly the opposite, it's the Kilimanjaro Safari at Disney's Animal Kingdom in Orlando, Florida. They just took a large flat agricultural land and recreated Africa. The Northwest Track was all native animals, and this was the opposite, everything had to be built, and was built very well. Except they had a storyline too specific, elephant poaching and rescue, which did not get the expected appreciation, whilst the visitor expectation was photography majorly. An otherwise well designed and exquisitely set-up, animal well trained too.



What are the key design aspects to consider when planning a safari from the perspective of visitors, staff- animal keepers, veterinarians etc.?

There's perhaps a global misunderstanding that you can hire the best talent to build and have the best zoo, but it's not the construction that matters, it's the people who run it matter. I have always felt that it is really important that you work with the people who are running the zoo. You help them design their zoo, it's not your zoo. So, you need to understand their strengths and weaknesses, you help train them and set up keeper exchanges with European zoos so that the staff can grow in their capacity and their knowledge. It is so important that women work in zoos, and break the cultural conservatism, it's a complex problem and not just design.

Zoos have been around for a very long time, but today I see Zoo animals as refugees from the human conquest of nature. For whatever reasons they were brought there, whether as spoils of conquest or welfare refugees or to save the species, the animals are there through no choice of their own and in most places they cannot be retired back to the wild, because the wild is gone. And even areas that are still wild, have as many tigers as they can hold, and you can't put a new tiger there because it is full.

In my ideal world, there wouldn't be zoos. But before there can be no zoos, we have to solve all those problems that created the zoo. So the least we can do is to build the best zoo and provide the best life possible for the animals we are taking care of. If we can use the animal in what I call a respectful attraction, where people can see them in a respectful setting and their lives are improved as a result of their visit, and at the same time money is generated to provide a good life for the animals.

But in all cases, I'm an advocate to say that the animals need choice and control because if you look at how many people complain about the zoos and the animals aren't free, I would ask what's free? I am not free, I mean, I'm privileged beyond what most people in the world are, but I have got obligations, I have got constraints and I can't go do anything I want. So, freedom is relative. And to me, I like to say that the organism with the most choice and control has the most freedom.

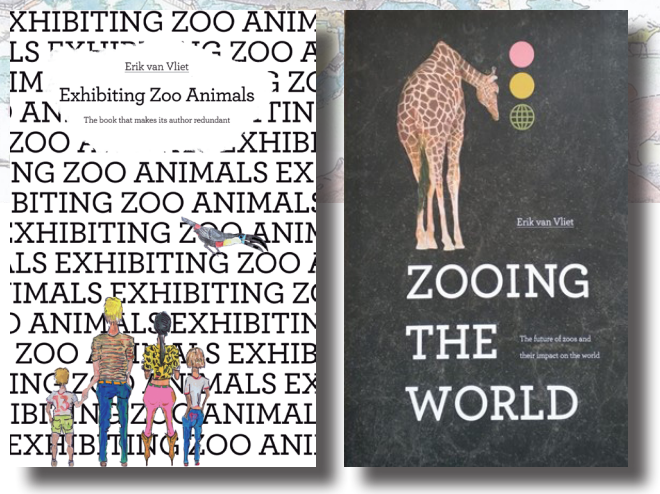
The caregiver animal relationship is critical. A good design needs to balance between, Science - Empathy - Inspiration and Creativity. There needs to be an interdisciplinary team, gender-balanced, old and young because they have collective wisdom and intuition and they can work back and forth.

The worst thing to do is to copy other zoos, you copy nature. One reason why the zoos are far behind is that they just copy each other, and every time you get a copy, it gets worse. Go back to nature and see how close we can get to that, whether you are doing it with artificial materials or natural materials.

If you read some of my papers, about the animal trails and overhead elevated pathway systems, it looks completely artificial but that's exactly what animals do in nature, they follow trails throughout the forest to connect to their critical resources. Again, it's understanding the basics of how they make a living in nature and substituting it. There are zoos where chimpanzees use touch screen computers to do cognitive tests, and at the end of the test, they get food, so they are earning a living. Instead of going through the forest to find food, they do these tests and earn their food. The animals do it both for food and also for mental simulation/ enrichment. So you can see the direct parallels to nature, but the appearance is completely different.

Lastly, I want to say is that things are changing very fast in the world and to stand still is to fall behind. The mentality of "why risk innovation" & the notion that change causes problems should change because the world around you is changing.

Glimpses from Thrissur Zoological Park, Kerala. It is under establishement which was designed by Jon Coe



TALKING HEADS

Erik Van Vliet

Architect & Zoo Designer,
Erik van Vliet Zoo Design,
Amersfoort, Netherlands

What kindled your interest in zoos and zoo designing? Do you have any interesting anecdotes of your zoo designing experiences?

My first visit to Amsterdam Zoo at the age of 4 was the first childhood experience that has survived as a memory. To all children, animals are utterly fascinating. It is in our genes! For me, the fascination remained most probably because I started volunteering at the local zoo at the age of 13. There are many anecdotes, most dear to me are those proving how sensitive and intelligent animals are. Don't bank too much on standards, regulations and experience, there are always individuals smart enough to prove them wrong.

According to you, how have zoos evolved over the years in aspects of enclosure design?

A big leap forward took place in the 1990s. The notion of immersion first came into being in the United States. This is such a powerful tool to allow visitors a feeling of entering into the habitat of animals and feel the relationship between habitat and animal. It makes visitors humble and respectful. It is a pity that immersion is not applied in more zoos. To do it right is not a matter of budget but of know-how.

What would be your personal preference – watching animals in a safari enclosure or in typical zoo enclosures?

Preferably a zoo enclosure but maybe not a typical one. Hiking instead of driving allows you to be outside and stay as long as you want. In a world in which we are aware that more cars and more emissions should be avoided, it is also important, not just symbolically, to ask people to leave their cars and come back to nature. Safaris however have advantages too. A captive audience in a safari train or bus is prone to listen to the guide and more or less forced to absorb the educational message. Ride-throughs certainly deserve their place. Ride-through or Drive-through and walk-past is not necessarily a choice. One can envisage an area where you can have a ride and from the side, you can look into the area over an invisible barrier, like an immersive moat. In this option, you 'sell' the exhibit twice and combine the advantages of an educational tour with quiet watching within a natural setting. It also takes the pressure off the ride on very busy days.

In your opinion, which are some of the well-planned safaris across the world?

Some of the first generation safari parks in Europe still exist and many of them are boring, inspiration-less and only commercial. A new generation setup constructed with core design sensitivity has developed mainly in Asian countries. I love Taman Safari in Bogor, Indonesia, and The African safari in Disney's Animal Kingdom in Florida and would love to visit the newly opened Sharjah Safaripark in the Emirates.

How do safari enclosures compare to conventional moated or cage enclosures in promoting the expression of natural behaviours?

In theory, there is no difference. The surface is also not the most important element. Important is what the animal can do within the enclosure. Natural substrate and climbing and hiding opportunities can be developed in either type of enclosure.

What are the key design aspects to consider when planning a safari experience from the perspective of the staff- animal keepers, veterinarians etc.?

Safety and being able to observe animals is a concern in large open areas. When entering for work, staff members must be sure that dangerous species are in their holding at that moment. Mistakes in this are the causes of most fatal accidents. Good protocols are the solution. Training the animals when they should come to their holding area is important.

What are the advantages zoo safaris offer over single exhibits from the point of view of mixed-species housing?

I do not think there is an advantage. In both types of animal presentations, mixed species exhibits can be developed with enrichment for animals and education for visitors.

In the context of "inventing the environment", what poses a greater design challenge, a safari or an enclosure space of smaller dimensions?

A safari is more difficult. In a walk-past exhibit, you create one, or preferably more viewing zones where observing the animal works best and the background is the most interesting. In a drive-through, the visitor sees the animals over a very long distance on each side of the vehicle. During that whole experience, the background must be interesting.

Where do you see zoo designing and zoos in the next two decades?

Zoos will be increasingly important in an urbanized world with increasingly less access to real nature. Of course, there are those opposed to keeping animals in non-natural conditions. Let's take their opinion seriously and keep improving. Exhibiting animals in immersion exhibits really tell something about their natural habitat.

ZOO IN FOCUS - INTERNATIONAL

DUBAI SAFARI PARK

Dubai Safari Park opened doors to the public in December 2017. It houses approximately 3,000 animals from across the world, over a 1,190,000-sqm site. The park emphasizes on customer experience, animal welfare, conservation and education as their mission and vision. Originally built on a landfill, Dubai Safari Park has transformed land into a reusable space using advanced technology. The buildings and electric vehicles use energy from solar panels. The park has an onsite reverse osmosis plant that filters, recycles water for animal water bodies, and repurposes food/animal waste into organic compost used as fertilizer across the park.

Divided into five thematic villages, each village displays animals belonging to the native area. Arabian Desert Safari is a drive-through attraction inspired by the species of the Arabian Peninsula. Asian Village displays ornate architecture and animals from the Asian continent. African Village provides a true taste of Africa, housing Gorillas, Chimpanzees, African Elephants, White Lions and Grand Aviary. In Explorer Village, visitors can experience Safari Journey, which is a drive-through discovery of animals from Africa and Asia continents. As well, as feed Giraffes at the platform or view Hippos in the gallery. Kids Farm is an area where visitors can view farm animals and feed Birds or Goats.

Dubai Safari Park's vision is to be leading in the field of inspiring action for sustainable wildlife. Our conservation efforts is in-situ and ex-situ, we strive to conserve species in our collection and those native to the UAE. Captive animals require healthy diet and enrichment to maintain them and we conduct research to increase our knowledge of animal biology, genetics, behavior, interactions and food habits. We collect and conserve viable gene pool for our future population by providing enrichment programmes focusing on preserving their natural habits, in hope that we may release some of these animals back to the wild. One of the projects that Dubai Safari is already supporting is the reintroduction of the Arabian toad into a suitable habitat in the United Arab Emirates. We also have plans to establish a large sanctuary for abandoned animals that are not included in our collection plan.

The park has numerous species that are severely threatened that there is a risk that they will go extinct. Over the past decades, zoos around the world have pooled their resources and set up a structure of coordinated, international breeding programmes for endangered species. Dubai Safari has already joined a number of international breeding programmes for endangered animal species such as Lar Gibbon and Pygmy Hippo. The Zoology and Conservation teams identify species that need conservation


ASIAN VILLAGE
القرية الآسيوية

breeding action; they will look at what species need special attention, and what we will do with the offspring. Dubai Safari Park has also applied for the membership of the European Association of Zoos and Aquaria.

The Safari Park has an in-house Veterinary Hospital well equipped with a Laboratory, Pharmacy for internal medical care and Quarantine facility that serves as the first port of rehabilitation process of newly arrived animals. The team focuses on development of various preventive medicine programs and annual vaccination of all the susceptible species, which are treated according to their needs, rehabilitate and incorporate them into our collection.

The Education team is in charge of developing and implementing the various education programmes for the park, and it works closely with the Conservation and Zoology teams to achieve an optimal result. We all know that people learn easily when the message is being given in a way that is entertaining as well as clear. Thus, we aim to educate visitors through three live show presentations that reiterate the message of animal welfare and conservation. Dubai Safari Park has also gone paperless in line with the UAE government policy, which reduces deforestation, preserves the ecosystem and maintains biodiversity. Dubai Safari Park provides customers with Behind-the-scene tours that engage them in educative conversations about how the animal caretaker provides special care to our animal collection. This experience will also give customers an opportunity to feed Elephants, Giraffes and brush White Rhinoceros.

The team conducts researches on zoonotic diseases and ensure the education team develops the findings into short talks and workshops for public learning. We place utmost priority on the physical and mental wellbeing of our animals and by doing so, keep them healthy and happy. We ensure that our visitors enjoy of views of healthy, strong and vibrant animal activities.

Illustration: World Pheasant Association International

TRIBUTE

Remembering Raja

A male Western Tragopan that was housed at Sarahan Pheasantry.

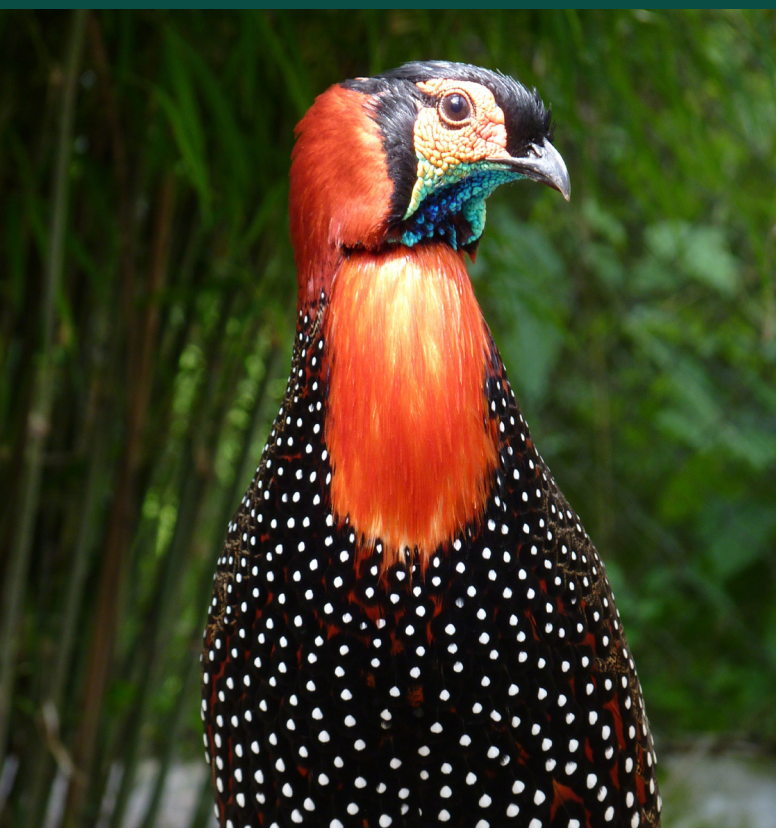
Text:
Mr. Lakshminarasimha. R
Scientific Officer, CZA

Sarahan Pheasantry situated in Shimla, Himachal Pradesh is a mini-zoo recognised as a coordinating zoo for the planned breeding program of the Western Tragopan. He was rescued from Rupi Village, adjoining Rupi Bhaba Wildlife Sanctuary, Kinnaur, Himachal Pradesh during the winters of January 2002. He was around 2 years old at the time and had full adult plumage. He was nursed back to health and continued to be housed at the pheasantry.

He was assigned the National Studbook Number #001 signifying that he was among the first individuals to be housed at Sarahan Pheasantry. He was among the 9 birds of wild-born origin comprising the founding stock of the conservation breeding program of the species. Throughout the time he was housed at Sarahan Pheasantry, he was paired with a female Rani, with whom he sired 5 chicks. The chicks sired by him have further bred and have contributed over 60 descendants to the captive stock. He died in November 2011 at 9 years of age.

While in captivity being unable to experience the wild anymore, he contributed to the establishment of an insurance population of Western Tragopan aimed at ex situ conservation of the species. In 2021, one of his great grand-children, a female aged around 2 years was released to the wild as part of an ongoing experimental reintroduction program of the species.

Throughout his life, Raja has been a true ambassador animal for his vulnerable species and his legacy continues both through his family, but also in his achievements in educating visitors about the need to conserve the species and the vital conservation work that will eventually save their wild counterparts.



Shiv, a male tragopan sired by Raja at Sarahan Pheasantry, Himachal Pradesh

Biosecurity In Zoos

Text:
Editorial Team, CZA

Captive wild animals are often vulnerable to several diseases of viral, bacterial and fungal origin. Biosecurity is the set of precautions taken to minimise the risk of introducing an infectious disease into an animal (or human) population. With today's growing focus on emerging diseases, it is important that all zoos, regardless of its size, focuses on all risks, not just those arising from exotic species. Good biosecurity practices help to keep zoo animals, staff and visitors safe and healthy.

Biosecurity is additionally concerned with minimising the negative consequences of infectious disease introduction and spread. Infectious disease within the zoo collection impacts health and welfare and can have long term impacts on reproduction, longevity, behaviours and population and species viability. The infectious disease could further spread to humans or domestic animals and have serious social, economic and ethical costs. Each zoo will have differing biosecurity challenges and operating environments and the zoo's unique characteristics will influence its biosecurity requirements. Zoos must therefore develop their own site-specific biosecurity plan keeping in mind the relevant legislations of that region and these gain specific importance when acquiring and managing species in the collection.

SECURITY MANAGEMENT PRACTICES INCLUDE:

- A planned and effective preventative medicine program for all zoo animals
- inspection, testing and quarantine of incoming animals, including species bred for release as part of a conservation breeding program
- isolation and treatment of sick animals
- veterinary investigation of illness and death in collection animals
- control of wild, stray and pest animals
- hygiene procedures for staff and visitors
- appropriately constructed and maintained facilities
- controlling drainage and waste disposal and
- ensuring food, water, equipment or work practices do not introduce or spread pests or disease.

Biosecurity is the responsibility of everyone at the zoo. All zoo staff need to be aware of the principles of biosecurity and how this applies to their work at the zoo.

It is important to consider all factors that may impact zoo biosecurity, including:

- species, origin and number of collection animals
- location and layout of the zoo
- source of water supply
- source of food supply
- method of waste management
- disease status in animal collections and proximity to animals in the surrounding area
- presence of pest species
- zoonotic disease potential
- animal movements and transactions
- movement of staff, visitors, contractors and deliveries.

MAJOR ROUTES FOR DISEASE AND PATHOGEN TRANSMISSION

An understanding of the major routes for disease and pathogen movement from, or into, a zoo is essential for assessing and managing risk and creating effective work practices. Managing risk is the key to good biosecurity. Diseases and pathogens may enter or exit the zoo via many routes. Any animal, human or product entering or leaving the zoo should be seen as a possible route or vehicle for disease transmission.

By having a comprehensive biosecurity plan in place; zoos can recognize risk factors timely, while localized, and can take steps to control and eliminate them before diseases become more widespread and put larger populations in jeopardy.

ZOO IN History

Kota Zoo, Rajasthan

Text & Photos:
Deputy Conservator of Forests (Wildlife), Kota

Established in the year 1905 by the then Maharaja of Kota, Kota Zoo is one of the oldest zoos in India. The journey of the zoo started with enclosures for the wild animals of the region, built amidst gardens and fountains, to entertain the royal guests. These structures have weathered the test of times and are standing strong, even today.

In 1954, control of Kota Zoo was taken up by DFO, Kota and was later transferred to Deputy Chief Wild Life Warden, Udaipur. In 1986, the Office of Deputy Conservator of Forest Wildlife Kota was established for the administration of this Zoo.

Kota zoo is currently recognised as a small zoo by the Central Zoo Authority. It is spread over an area of 2.2 hectares and it has 12 enclosures housing Leopard, Hyena, Jackal, Bonnet Macaque, Gharial, Mugger, Chital, Nilgai, Sambar, Blackbuck, Chinkara, Indian Rock Python and birds.

To align with the dynamic conservation priorities and to meet the best practices of animal care and welfare, the imminent need is to develop larger enclosures for the animals to provide more space. It was proposed to relocate the zoo to a forest block near Abheda Mahal. An area of around 143 hectares was demarcated for the development of the new Abheda Biological Park. The Kota zoo continues to function as the rescue centre for wild animals as most of the animals have been shifted to the display enclosures at Abheda Biological Park.

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