ZOO'S PRINT

Communicating Science for Conservation

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Contents

Cover design by Latha G. Ravikumar and G. Arul Jegadish, Zoo Outreach Organization, Coimbatore

WHY WE HAVE ZOOS?

In the Past
Whatever anyone may say, the REAL reason we have zoos is because people like to look at animals. That is how it all started. Rich, powerful people collected animals because they liked to look at them and show them to friends, family and colleagues. Soon, other people saw that they could make money by collecting animals for sale and also by showing animals to other people for a fee.

So a great many animals were captured, and many others killed in the process. When it was no longer cheap and easy to obtain animals from the wild, THEN people started keeping rare species for conservation.

Present
Today many zoos exist in order to promote conservation of wildlife. Other zoos exist for commercial or political reasons. Zoos which are trying to conserve wildlife are likely to have better standards than zoos run for entertainment and financial gain, although not always.

Reproduction - breeding wild animals for
. preserving biodiversity
. display in other zoos so they don't take from the wild
. animal health and well-being

Research - scientific study on wildlife
. behaviour and biology
. things that can't be studied in wild
. needs in captivity and wild
. for better conservation.

Education - teaching in a living natural history museum
. responsibility for our piece of the world
. respect for all life forms
. interest in wildlife conservation
. treating all animals with kindness

Future
In the future, we want all zoos to be committed to wildlife conservation... in word and in action. We want all zoos to be conservation-conscious. That is the opposite of conservation-careless. Conservation-conscious zoos can conduct effective conservation activities.

By Sally Walker. © Photos: Joel Sartore

Zoo Outreach Organisation (Z.O.O.) likes zoos that are "conservation-conscious". These are zoos that provides good living conditions for their animals and promote wildlife conservation. These zoos also carry out activities which aid wildlife conservation.

Z.O.O. calls the other kinds of zoos "conservation-careless" zoos. Often a "conservation-careless" zoo is also careless about animal welfare and ethics.

CONSERVATION-CONSCIOUS ZOOS & CONSERVATION-CARELESS ZOOS

Conservation-conscious zoos have most of these things ...

- a permanent site and supportive environment for animals
- management for the greater good of the community
- adequate finance
- record keeping
- priority of kind treatment of animals
- meet legal requirements
- trained and interested staff
- clean & safe enclosures, pens, yards, spacious, naturalistic enclosures
- a small number of mated species
- fresh, nutritious foods & clean water
- healthy animals and healthy staff
- veterinarians according to number of animals
- good educational signage; an education & a conservation programme
- a breeding strategy for all animals
- a Mission Statement
- a Master Plan for development
- conservation as its highest value

Conservation-careless zoos have some or all of these ...

- unsanitary, always smelly enclosures
- unhealthy animals
- nervous, frightened-looking animals
- apathetic, non-skilled staff
- uncertain economic future
- insufficent finance to run properly
- bad or no educational signage
- no education programmes
- overcrowded exhibits
- small cage style enclosures
- no enrichment in cages or enclosures
- high death rate & low birth rate
- inadequate organisation
- spoiled food left in enclosures
- water needs changing
- faeces and urine not collected
- corruption
- frequent transfer of officials
- inadequate powers for staff
- no control over public behaviour (teasing, feeding vandalism)
- no breeding controls- surplus animals
- organisation run for individual profit

Conservation-careless zoos do not achieve sustainable management. Such zoos can cause species extinctions, through

- high death rate due to bad care, bad living-conditions and lack of husbandry & veterinary care
- poor sanitation, nutrition, preventative medicine, etc.
- indiscriminate capture of wildlife
- use of unethical animal suppliers
- wrong release of surplus wildlife
- inability to convey right values because of quality of facility visitor misbehaviour like feeding, harassing, vandalism

IMPROVEMENT, NOT CLOSURE OF ZOOS

Animal welfare activists and also enthusiasts often say that all the zoos should be closed and their animals released into the wild. That's NOT a good idea. Why?

Even if everyone agreed that all zoos should "free" their animals, it is unthinkable to release them to the wild. It is not only not-kind to animals being released, it is also not-kind to animals living wild in forests. Why is that so?

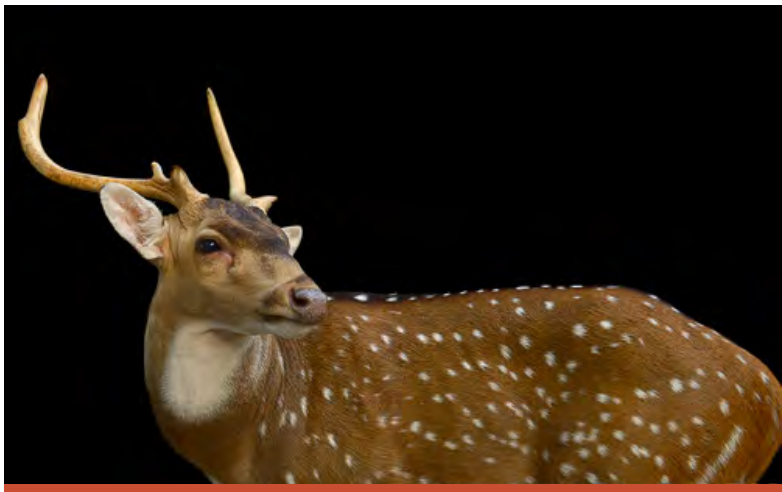
No survival skills -- Animals which have spent their lives in captivity don't know now how to survive in the wild. They would die miserable deaths, not having the experience of living in forests.

Insufficient space or territory -- Even animals which have lived in captivity a relatively short time and which learned and remember how to survive in the wild, may not thrive due to a subtle signal that may attract wrong attention from other wild animals, or because all territories are already occupied and the released animal cannot find a place to settle down.

Disease -- Animals in captivity may have been infected with diseases, parasites or conditions called "zoonoses" from other captive animals or zoo staff and take these to the wild when they are released.

Do you know how many zoos there are in the world? No? Well, nobody knows exactly how many facilities that call themselves "zoos" or a similar name there are. About 1000 zoos come under zoo associations whose goal is to improve them if they are conservation-careless. But there are many thousands more which have no such goal.

Imagine if all these animals in all these facilities were released to the wild!. The "wild" is already too small to support existing wildlife. These animals would over-run existing habitats and force out the natural wildlife, or carry disease that could kill many wild animals. This is a kind of "wild and free" nobody wants. It is conservation and animal welfare careless!.



When a "conservation-careless" zoo is closed, it is not good news; it is a tragedy because the animals have no place to go. "Conservation-conscious" zoos should not take them and they should not go the wild. Many animal facilities should be closed but what would be done with the animals?

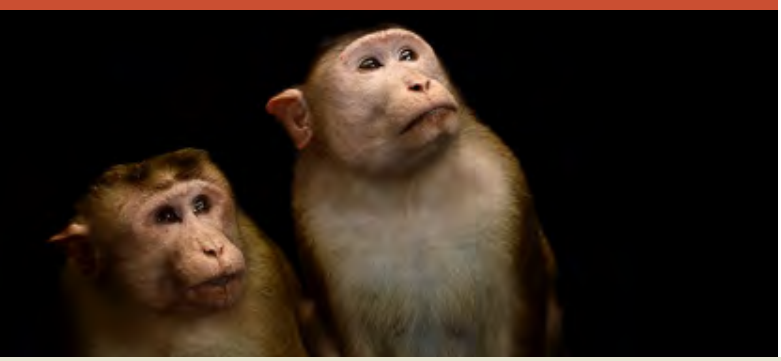
We are on a crusade to improve "conservation-careless" zoos, rather than close them ... unless they are absolutely beyond salvage. We may never be able to improve ALL zoos but we can try to make a difference and educating the public about zoos. What can YOU do to help make a conservation-careless zoo into a conservation-conscious one? Read on !

These reasons are only the tip of the iceburg.

REASONS NOT TO CLOSE A ZOO

When authorities close a zoo, they often think of releasing the captive animals to their natural habitat, and some do. Consider these statistics and decide if animals are better off after this ...

- 75% of captive-released mammals die within a year.
- Mammals are territorial: when re-located they try to go home which puts them in conflict with humans or predators for which they are prey.
- Captive-release tampers with the natural balance of forest eco-system.
- If the forest is ideal, it already has other residents of the same species.
- Urban animals will NOT survive in forest areas. Survival skills are taught by wild life not zoo life.
- Animals accustomed to zoo food will NOT spontaneously know the varieties of edible forest fruits.
- Mammals have a strong habitat preference. Monkeys accustoned to living with people will find other people and become dangerous pests.
- Zoo animals released into forests in South Asia normally are not monitored and may all be dead.
- Release after captivity is tantamount to pitting one animal or troop against another.
- Release after captivity is likely to result in a slow, cruel, agonizing death.
- Release after captivity is the same as dumping out of sight
- Release after captivity most often results in the very opposite of conservation



CRITERIA FOR RELEASING CAPTIVE ANIMALS

· Captive-release should be used only as a conservation tool for threatened species.
· Captive-release is the last choice in conservation tools for a species because it is so hard.
· A Special re-training and acclimatization is crucial for any chance of survival for captive-released animals.
· Animals slated for release should not be hand-fed or hand-reared.
· Animals to be captive-released must be screened for disease.
· Releasing subspecies into a locality can result in genetic pollution.
· Release site has to be meet very stringent requirements – habitat quality, prey/food density, access to water, adequate size.
· All animals have to be monitored after release.
· The cost of rehoming animals is staggering. It is cheaper to improve zoos.

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HOW TO HELP?

When people get it into their heads to help the animals at a zoo, the first thing they do is go for the Director and staff. This is usually wrong.

First of all most people do not know what is really bad in zoos. They think they do, but they don't. They worry that animals which are perfectly fit, are too thin, because they are not as fat as their family dog. Or that the lions are in pain because they are roaring, when it is their nature to do so. Etc. People have funny ideas about animals and particularly animals in captivity.

Most South Asian zoos are controlled by city or state governments and in most cases, governments own the zoo, get the gate money and give the zoo a grant to run. The Director often lacks sufficient financial powers to make improvements in the zoo even if money is there. It is easier for the zoo to get huge sums to construct a new enclosure, than minute amounts to keep the old enclosures in repair.

The Director often belongs to another service and has no experience of zoo or animal management. In South Asia the people closest to the animals -- the zookeepers -- are ill paid and uneducated.

The point is that if you are interested in improving your zoo, you need to start somewhere to the north of the director and staff ...somewhere higher up. You need to examine the laws of your country and state to see if there is any zoo and animal welfare legislation. You need to find out if the director and staff have avenues of training, sufficient finance, sufficient powers, etc. If not, then what can they do? What can you do to help them?

Zoo management is one of the most difficult and delicate jobs in the world. Managing a zoo (that is, a conservation-conscious zoo) is like conducting very high level medical research in a laboratory with visitors peering over your shoulder, munching popcorn, perhaps shouting at their schoolmates, etc. Or it is like trying to send a rocket to the moon with a constant stream of visitors who feel constrained to comment on every aspect of your work, and a press which gives more respect to the onlookers than to the scientists, etc. How do you save lives in such a medical lab? How do you make the rocket safe for the astronauts. How does a zoo save species in those conditions?

That is why we at Zoo Outreach Organisation are fond of saying Zoo Management IS rocket science. Because it is as or more difficult, subtle and stressful. Medical labs and rocket scientists have lavish budgets. Nothing is spared. Zoos, particularly in tropical countries, have to manage on a fraction of what they require. In India, the Zoo Act and Central Zoo Authority are very strong zoo legislation. Still some problems persist but there has been great improvement.

WHAT YOU CAN DO TO HELP

Be positive and constructive, not petty and critical.
Be Conservation-Conscious, not Conservation-Careless.

As a regular zoo visitor :

- You can help a zoo by obeying its rules & by being CONSERVATION-CONSCIOUS yourself.
- keep the zoo clean; put trash in bins
- keep the zoo safe; don't sneak in food, plastic bags, etc. to give to animals or throw in enclosures
- keep animals safe: don't tease or feed animals or run in front of cages or make loud noises. Watch them respectfully
- keep zoo property nice - don't mark on signs or buildings or damage anything
- report faulty taps which are wasting water; turn off water in zoo toilets when you use them
- never offer zookeepers money to give you special privledges or animal products
- treat the zoo as if you had to live there. As a public zoo, it is yours too.

As an individual volunteer ...
Sometimes an individual who is particularly interested and has time to devote to the zoo can go to the Director and ask for a chance to volunteer. Some things a new volunteer could do are:

Help control visitor misbehaviour
In South Asia, zoos get a lot of visitors. Zoo staff spends a lot of time trying to protect the animals and zoo property from the visitors who tease and feed the animals and ruin zoo property. If you see someone doing these things you can tell them to stop.

Help educate the public
Only a few Asian zoos have deemed Education Officers to look after zoo education for the public. You can help with this important component of zoo conservation. There are never enough educators for conveying the important messages of wildlife conservation. You need to contact the zoo administration and ask them if they want help. They may not. Don't force them. Try and build a relationship by providing services that help them.

Help the zoo's image
Unless your zoo is extremely conservation-careless, there will be many things to highlight about its contribution to the community, either potential or actual. Tell your friends these things. You can also write articles about the good things the zoo is doing. If something bad happens, try and find out the story behind it. Often mishaps that are reported as the fault of the zoo are actually not so.

As an organised group
Start a Friends of the Zoo (FOZ)
This is not a small undertaking. It is a big step, and one that can both help and hurt depending on the motives of the people who start and also the attitude of the zoo.

Friends of the Zoo could help the zoo ...

- by attracting financial help or "in kind" material for zoo projects from industrialists and other business persons.
- by lobbying the government to increase the zoo's budget in areas not deemed important by some officials
- by providing a volunteer work force to help with education, monitoring the enclosures, guiding tours, etc.
- by outreach activities into schools, hospitals, orphanages, etc.
- by being available in emergencies/natural calamities to do whatever is needed by the zoo
- by finding and bringing experts in specific topics needed by the zoo, such as a safety expert, or a hygiene expert, or a nutritionist, or an educationist, etc.
- by contacting other Friends of the Zoo groups around the world and learning what they do.

PRO'S AND CON'S OF ZOO VOLUNTEERS

Zoo volunteers can be a best friend or a worst enemy for a zoo and its animals. There are several reasons for this, none of which you as a potential zoo volunteer will like to hear ... but here goes.

1. Volunteers often think they know more about zoo management than the zoo authorities.
2. Volunteers have different motives -- some want "perks" and publicity at the zoo and others genuinely want to help (both can be dangerous in the zoo).
3. Volunteers cannot be held accountable - the only punishment for a volunteer is (maybe) expulsion from the zoo while employees can be suspended or sacked and have a permanent black mark against their service record.
4. Employees can be punished for mistakes made by volunteers
5. Volunteers normally want to get their hands on the animals which is the worst danger for animals, zoo administration and volunteers.

One reason why voluntarism has not come up very well in South Asian zoos is because South Asian institutional administration is very different from that of many other countries. Many zoos are run by governments in South Asia and that carries its own benefits and difficulties.

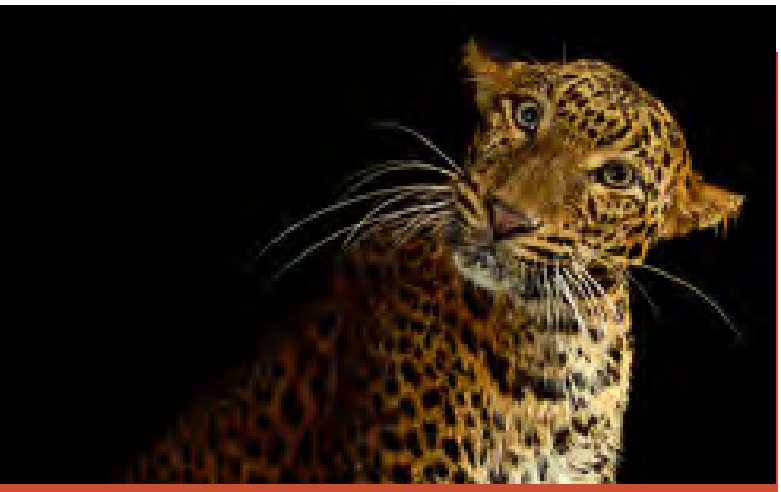
In the U.S., Canada, Australia and to a smaller extent Europe, most of the zoos have very active zoo volunteer programmes with numbers ranging from a few, involved in a very limited way, to hundreds and even thousands of members or volunteers doing every kind of job in the zoo.

Some zoos in western countries restrict their volunteers to the Education Department. Others have trained volunteers to assist with round-the-clock observation and other research. Other jobs volunteers do are : stuffing envelopes, typing, running errands, manning information desks, cleaning work, creating touch tables, specialised garden work, babysitting and handrearing animals, fundraising, guide service, observational research, surveys, etc.

Being a volunteer sometimes makes it possible for the zoo administration to know you and discover your potential in the zoo and help you find a career. In an administrative system where there is upward mobility and freedom of hiring and firing, this works. In western countries zoo management is perceived as an interesting and even prestigeous career choice.

In South Asia where there is such a high public visitation and such a low government investment in zoo education facilities, volunteers could contribute enormously to educational efforts and potential of the zoo. Yet, voluntarism has not developed much. Some of the reasons are those listed above, but the most important aspect of volunteers v.s. management is attitude. Both sides need to have an attitude of gratitude . . . the management for having a source of free help and the volunteers for an opportunity to do some meaningful work. Neither side should feel, that they are doing the other a big favour, however. Volunteers have free will — they are, or should be, volunteering for their own need to do public service. NGO's and governmental organisations often have communication problems. That being the case, we developed some guidelines for volunteers, or Friends of the Zoo groups, which have been used both in India and in South East Asia for over 2 decades.

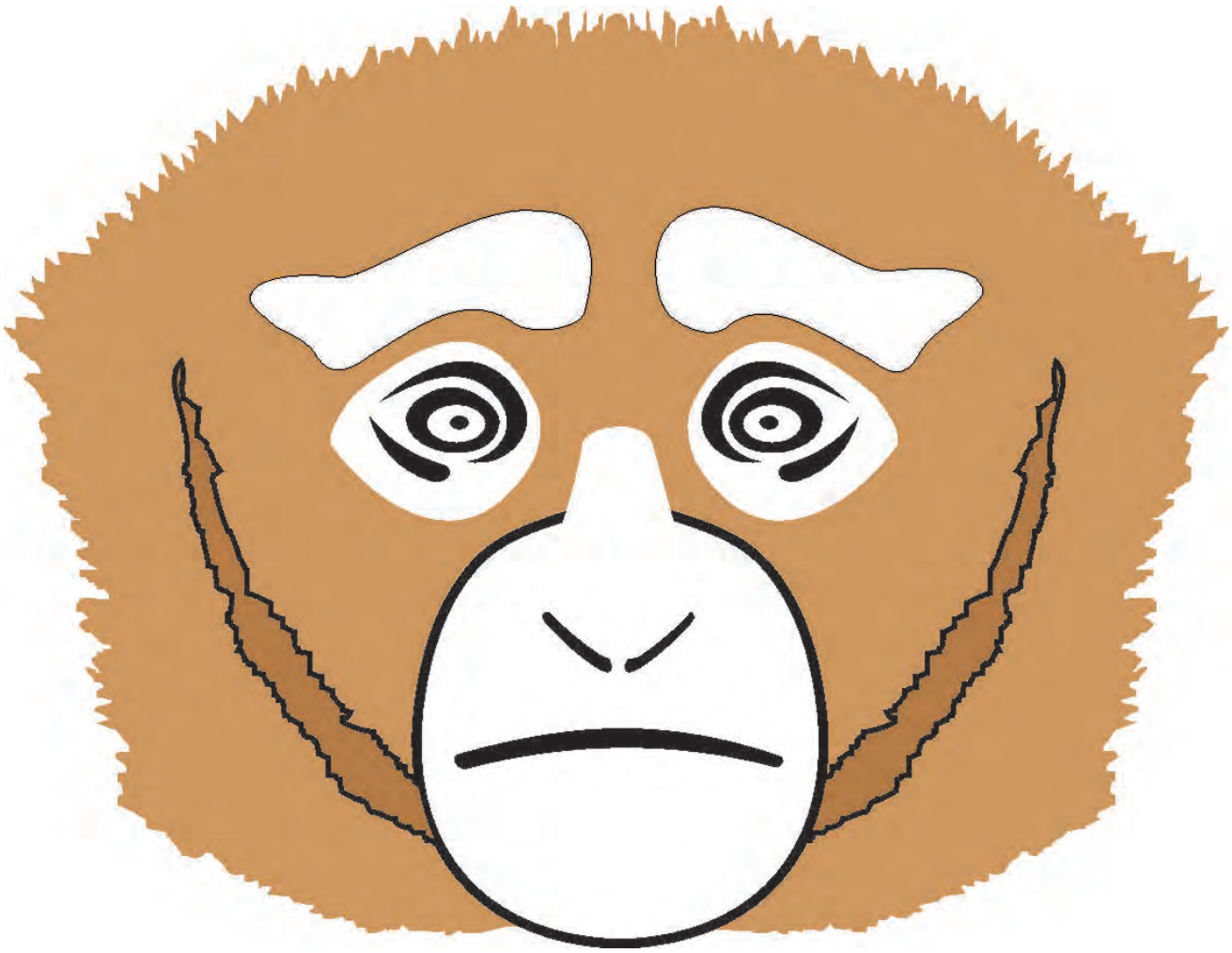
PRINCIPLES FOR POSITIVE ACTION - HOW TO BE A GOOD ZOO VOLUNTEER



1. Make yourself useful. Provide solutions and not more problems for the zoo director. He knows what the zoo needs most from volunteer helpers. What you think will help might cause more problems for the staff and the animals.
2. Remember : your love for animals doesn't make you an expert in animal management. Your experience is probably pet or domestic animals; wild animals, even if captive, have to be kept very differently.
3. Conentrate on projects that your can do, starting with simple, straight-forward ones that have practical output. Build your credibility with such projects.
4. Accept that there are things about the zoo that you don't like but will not be able to change. Be satisfied with small improvements to any aspect of the zoo and take it as a challenge to work creatively within that context.
5. DO something. Don't just sit around passing negative remarks. Positive and constructive action will produce more and better results than complaints.
6. If you start a Friends of the Zoo, make it clear to volunteers / members that FOZ exists for the zoo and not the other way around. PrivIleges should consist of satisfaction of a job well done, (or at least well meant!).
7. Cooperate with other organizations interested in wildlife, environment, welfare, etc. but affiliate with none. Keep your own identity and principles.
8. Do not be condesending to zookeepers. They may not be well-educated but if they have worked with the animals for some years, they know a lot and can teach you practical things. Let them teach you and you may then teach them what you have learned about wild animals from books.
9. Do not try to help the keepers with their labour problems or administrative complaints. That is a time bomb with a very short fuse and your name is on it.
10. Insist on high standards of behaviour from all members and volunteers. Someone in the zoo won't want volunteers. One bad volunteer can justify his complaints and destroy months of hard work by right-acting volunteers.
11. Do not "tell tales" outside the zoo. Zoo management has its difficulties. Inexperienced persons can misinterpret things they don't understand.
12. Do not ask for projects involving live animals. If the animal dies or hurts someone while under your care, you and your FOZ will be in big trouble. BUT the zoo director will be in worse trouble ... his job, not his hobby, is at stake.

You may think these principles take all the fun out of working voluntarily at the zoo. Far from it. These principles can insure that you are permitted to stay in the zoo and do wanted works. It is a tremendous satisfaction. Go for it !

Print this mask on a card and cut it



Female Hoolock Gibbon

Collect these masks for exciting games

INDIAN BULLFROG

Predation record on *Duttaphrynus* species by *Hoplobatrachus tigerinus* (Daudin 1802)

***Hoplobatrachus tigerinus* feeding on *Duttaphrynus* sp.**

IUCN Red List:
Least Concern
(Padhye et al. 2008)

Indian Bullfrog *Hoplobatrachus tigerinus* (Daudin 1802) is the largest frog in South and Southeast Asia (Rahman et al. 2012) and also one of the endemic anurans of Indian subcontinent including countries like India, Bangladesh, Pakistan, Nepal, Myanmar, Afghanistan and Sri Lanka (Padhye et al. 2008; Surendran & Vasudevan 2013). The species is also recorded from Maldives and Madagascar (Surendran & Vasudevan 2013) and enlisted as 'Least Concern' according to IUCN Red List of Threatened Species (Padhye et al. 2008).

Amphibia
[Class of frogs, toads, salamanders]

Anura
[Order of tailless amphibians]

Dicroglossidae
[Family of fork-tongued frogs]

Hoplobatrachus tigerinus
[Indian Bullfrog]

Species described by Daudin in 1802

Hoplobatrachus tigerinus is a solitary and nocturnal anuran in wild. The species inhabits in holes and bushes near permanent water sources (Dutta 1990). The frog does not stay in the water for a long time but spends most of its time in surrounding vegetation for hiding and feeding (Chanda 2002). They are monsoon breeders. Adults congregate at ephemeral rainwater pools at the time of breeding (Dutta & Mohanty-Hejmadi 1976).

Indian Bullfrog preferably feeds on invertebrates, small mammals like mice and shrews, young frogs and toads, juvenile snakes and small birds (Khan 1973; Rahman et al. 2012; Datta & Khaledin 2017).

Global Distribution:
Native: Afghanistan, Bangladesh, India, Myanmar, Nepal, Pakistan (Padhye et al. 2008)

The current incident depicts the photographic record of feeding on a toad *Duttaphrynus* sp. by Indian bullfrog *Hoplobatrachus tigerinus.* The episode was opportunistically observed in an abandoned stone quarry near a water body in Matheran of Maharashtra, India (19.0017^{0}N & 73.2675^{0}E) on 16th June 2016 at 23:09hr. During the episode, one sub-adult male of *Hoplobatrachus tigerinus* was observed feeding on a live toad *Duttaphrynus* sp. Indian Bullfrog started eating the toad from its anterior part and engulfed it within 18 minutes. After feeding, the predator was in immovable phase for 20 minutes and subsequently moved into the water.

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YELLOW-SPOTTED WOLF SNAKE

New locality record of *Lycodon flavomaculatus* Wall, 1907 from Telangana, India

A - Full body - dorsal view; B - Head close-up - dorsal aspect;
C - Head close-up - lateral aspects; D - Full body - ventral view

IUCN Red List: Least Concern (Srinivasulu et al. 2013)

Reptilia
[Class of Reptiles]

Squamata
[Order of Scaled Reptiles}

Colubridae
[Family of Snakes}

Lycodon flavomaculatus
[Yellow-spotted Wolf Snake]

Species described by Wall in 1907

Yellow-spotted Wolf Snake *Lycodon flavomaculatus* Wall, 1907 is endemic to India with confirmed records from Dharwad, Karnataka; Sangli, Pune, and Nashik, Maharashtra (Wall 1907); Buldhana and Vidarbha, Maharashtra (Wall 1923); Amravati and Melghat, Maharashtra (Pradhan 2005; Nande & Deshmukh 2007); Raigarh, Chattisgarh (Walmiki et al., 2011); Satara, Maharashtra (Chikane & Bhosale 2012); Solapur, Maharashtra (Srinivasulu et al. 2014); Nagpur, Maharashtra (Deshmukh et al. 2015); Bhanvagar and Vadodara, Gujarat (Vyas & Upadhaya 2008); Balaghat and Mandla, Madhya Pradesh and Sarguja, Chattisgarh (Srinivasulu et al. 2014); Vidisha, Madhya Pradesh (Sharma et al. 2015);

Virudhunagar, Tamil Nadu (Melvinselvan et al. 2016); Belgaon, Adilabad, Telangana (current report).

Global Distribution:
Endemic to India (Smith, 1943; Whitaker & Captain, 2004; Melvinselvan et al. 2016)

On 28th August 2016 at 20:00hr, Mr. Sarpatwar Shreyash, a member of the "Friends of Snakes Society", came across a dead snake at Belgaon, Jainath Mandal, Adilabad (19.7303⁰N & 78.6947⁰E, 219m). The locals confirmed that this specimen was killed as it had wandered into a household. The locality was primarily dry, surrounded by black and red soils, with predominant cultivation of cotton and soybean. The specimen was examined and identified as *Lycodon flavomaculatus* Wall, 1907, based on the morphological characters as defined by Whitaker and Captain (2004). Neither, the morphometric measurements were recorded nor the individual's sex could be determined due to advanced stages of decomposition.

Few locality records.
● - Type locality (Dharwad, Karnataka)
■ - Closest record to the present (Nagpur, Maharastra)
▲ - Present record (Belgaon, Adilabad

This is the first record of *L. flavomaculatus* from the state of Telangana. The previous closest locality record of this species is Nagpur, Maharastra (Deshmukh et al. 2015), which is at a geodesic distance of 172km from the current locality.

The dorsum had shiny, dark brown scales with contrasting yellow spots along the mid-dorsum, from the cervical region to the tail tip. Each yellow spot laterally descends into white triangular patches, of decreasing prominence from anterior to the posterior body. Further, due to advanced stages of decomposition, the outer-most layer near the cervical region peeled out while handling, revealing white spots underneath, instead of yellow. The supralabials and the ventral scales were glossy white. Retrievable pholidosis - dorsal scales - 17 rows (distance of a head-length at the neck); ventrals - 170+ (approximate); subcaudals - 54 (paired); anal scale - divided; supralabials - 9 (4th and 5th in contact with the eye); preocular - 1; postocular - 2; loreal - 1.

Over a century since its discovery, only twenty documented records of *L. flavomaculatus* exist. A thorough scientific assessment is required to establish a more explicit range and habits of this species.

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YELLOW-FOOTED GREEN PIGEON

Notes on nesting behaviour of *Treron phoenicoptera* in a semi-urban area of Bangladesh

Adult Yellow-footed Green Pigeon in a nest with nestlings

IUCN Red List: Least Concern (BirdLife International 2016)

Aves
[Class of Birds]

Columbiformes
[Order of Pigeon, Doves, Dodos and Solitaries]

Columbidae
[Family of Pigeons and Doves]

Treron phoenicopterus
[Yellow-footed Green Pigeon]

Species described by Latham in 1790

The Yellow-footed Green Pigeon *Treron phoenicoptera* under family Columbidae is a common bird species distributed throughout South and Southeast Asia (Ali & Ripley 1987; Baptista et al. 2016). Five sub-species have been identified—*T. phoenicoptera phoenicopterus* distributed in India and Bangladesh; *T. p. chlorigaster* in Pakistan and India; *T. p. phillipsi* in Sri Lanka; *T. p. viridifrons* in China, Myanmar and Thailand and *T. p. annamensis* in Thailand, Laos, Cambodia and Vietnam (Baptista et al. 2016). The Yellow-footed Green Pigeon is widely distributed in Bangladesh and it has been categorized as 'Least Concern' species regionally as well as globally (IUCN Bangladesh 2015; BirdLife International, 2018). It occurs mainly in deciduous forests, homestead gardens, groves, forest fringes and cultivated land with scattered trees. As a frugivorous bird this

bird feeds mainly on figs and berries and spends most of the time on fruit-yielding trees in groups of 5–20 individuals (Naher 2015). The breeding behaviour of this species is poorly known. This note constitutes the preliminary data on breeding behaviour of Yellow-footed Green Pigeon in a semi-urban area at Jahangirnagar University Campus, Bangladesh.

Jahangirnagar University is located in the central region of Bangladesh and about 32km north of Dhaka, the capital of Bangladesh. The study area is located at 23.8797^{0}N & 90.2680^{0}E. The climate is characterized by hot and humid summer with rain and comparatively dry and cool winter. The study area has diverse ecological habitats and consists of grassland, cultivated land, bushes, woodland, monotypic plantation, wetland and human settlements. The diverse habitat of the study area supports large number of plants and animal species, which makes the campus area an important ecological site to study flora and fauna. A total of 230 plant species have been recorded from this area belonging to 159 genera and 62 families (Hossain et al. 1995). The study site is the home of 195 bird species belonging to 43 families (Begum 2016). The Yellow-footed green pigeon was recorded as a resident breeding bird species (Mohsanin & Khan 2009). The present study was conducted in 2016 between February to August.

Global Distribution:
Native: Bangladesh, Bhutan, Cambodia, China, India, Laos, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Viet Nam (BirdLife International 2016)

Eggs of Yellow-footed Green Pigeon

During the study, a total of 13 nests were recorded. Among the nests, we were able to study only three nests, that had access. The first nesting attempt in the breeding season of 2016 was observed in April whereas the last one was recorded in June. Nests consisted of very simple structure and were made of small twigs placed crisscrossed over each other. Eggs were white in colour without any spot and were glossy in texture. The average size of the egg was 30.11 mm x 22.55 mm (n=2). The nesting tree species were — Mahogany (*Swietenia mahagoni*) (n=2), Teak (*Tectona grandis*) (n=7), Acacia (*Acacia auriculiformis*) (n=1), Koroi (*Albizia lebbeck*) (n=2) and Sal (*Shorea robusta*) (n=1). The nest height above the ground varied largely from 5.5–20.1

Table 1: Growth of the nestlings of Yellow-footed Green Pigeon

	Weight of chicks (gm)		
Individual no.	Day 2	Day 5	Day 10
1	13.3	41.4	73.5
2	14.3	44.2	80.4

Nestling development of Yellow-footed Green Pigeon - Day 5

m (n=13). Incubation period of the Yellow-footed Green Pigeon was not known as all the nests observed were found either with egg clutches (laying date of the first egg was unknown) or with chicks. The newly hatched chick was naked skined with soft white hair and no pins were visible. The feather pins emerged on the fifth day and rapid growth was observed thereafter. After that the contour feather, primary feather as well as remiges and rectrices started to develop. On the 10th day, the fledgling had fully grown contour and flight feathers with olive green colour and was ready to fledge. The body weight of the nestlings (n=2) increased steadily since the day of hatching until they were 10 days old (Table 1) a digital pocket scale was used to measure the body weight. The fledgling left the nest on the 13th day.

Breeding season of the Yellow-footed Green Pigeon lasted from April to June as reported by earlier observations by Devi & Saikia (2012) and Rasmussen & Anderton (2012). This is known to lay 1–2 white eggs and the incubation period is 20-24 days (Devi & Saikia 2012). The nesting height varied between 5.5 to 20.1m from the ground and the most preferred nesting tree was teak (53.8%). Rahman (2008) also described egg size of the same species is 29mm in Bangladesh. *Treron p. clorigastor* has egg size 31.8 x 24.6 mm (n=40) (Ali & Ripley 1983).

Nestling development of Yellow-footed Green Pigeon - Day 10

Our natural history observations provide the baseline information on breeding behaviour of the Yellow-footed Green Pigeon in a semi-urban area of Bangladesh.

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COPPERSMITH BARBET

A short note on the courtship behaviour of *Psilopogon haemacephalus*, Müller, 1776

Coppersmith Barbet

IUCN Red List: Least Concern (BirdLife International 2016)

Aves
[Class of Birds]

Piciformes
[Order of the woodpeckers and relatives]

Megalaimidae
[Family of Asian Barbets]

Psilopogon haemacephalus
[Coppersmith Barbet]

Species described by Müller in 1776

Coppersmith Barbet *Psilopogon haemacephalus* (Müller, 1776) is a bird of the family Megalaimidae. It is a small dumpy grass-green barbet with yellow throat, crimson breast and forehead and green streaked yellowish under parts. Short truncated tail is distinctly triangular in flight silhouette. It chiefly eats fruits, berries and sometimes winged termites. The breeding season of the bird is November to June and it makes a hole-nest (Ali & Ripley 2007). The red and yellow bands on the chest are brighter in the male as compared to the female counterpart. The bird is a breeding resident of Rajasthan State (Sivaperuman et al. 2004; Sangha & Devershi 2006; Ghazala et al. 2006; Mohammed et al. 2011; Koli 2014; Joshi & Bhatnagar 2015) and can be seen in open wooded country, groves and urban gardens (Ali & Ripley 2007; Grimmet et al. 2013).

On 15 June 2014 during our morning field visit to the wetland of Arwad Village (25.8288^{0}N & 74.8188^{0}E) of Bhilwara District in Rajasthan, we saw a pair of Coppersmith Barbet on Babul tree *Vachellia nilotica*, engaged in courtship. The tree was located on the bank of a small water body on the other side of which was a concrete road connecting two human dwellings of the same village. People and small vehicles moved frequently on this road. There was an open agricultural land beyond the road. We saw the events of courtship behaviour of the Coppersmith Barbet pair and photographed the activity using Canon 1200 DSLR

Global Distribution:
Native: Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Viet Nam (BirdLife International 2016)

While observing, the pair was found to be perching on twigs. The male then started fluttering its wings and spread the tail feathers as a fan. It then bent its limb so the abdomen became flat and was in direct contact with the branch. Initially, the female did not take any notice but later it began to see the male. After two minutes the male approached the female and sat near it having alike orientation and started fluttering its wings. Then the male changed its orientation to 180^0 and continued to flutter its wings. The female sitting almost two feet away, did not pay any attention to the male. The male now came closer to the female. When the male was very close, the female opened its bill probably in anticipation of food, although, we could not see any food material in male's bill. Thereafter the female inserted its bill into the male's bill. In this locked position they shook their heads and bent up to 90^0. After sometime the male fluttered its wings once again and flew away

to another branch.

After one minute, the male again approached the female and sat at a twig behind the female. As soon as the female saw the male, it oriented itself towards the male. The female was looking more attentive this time. The male started hanging fluttering its wings and simultaneously changed its orientation. Then it hanged upside down on the twig. After this behaviour, the male approached the female and they once again locked their bill, *albeit* only for a few minutes before separation. After the separation, the male went back to its original position and the female approached him eagerly. It repeated the same action upside down like the male and moved closer to the male. During the course of this behavior, the male kept its wings fluttering. Then the male flew away once again.

The male then returned after approximately 50 seconds and perched itself on a twig above the female and started fluttering its wings. When fluttering the wings it repeatedly moved its body from left to right. Simultaneously it moved its head up and down. This activity might have been used to show the bright red colour of neck and head to the female. After few seconds of this action female went close to male and opened its bill. The same action of bill locking was repeated this time. Then the male fluttered its wings vigorously for a few seconds and flew away. Thus the cycles of getting closer,

fluttering of wings, grasping each other's beak and flying away of male were repeated again and again.

During this 12 minutes observation, there was regular movement of people and vehicles. After this a large truck passed by and the noise from the truck disturbed the pair and both the birds flew away. We followed the birds for some distance but they disappeared into the agricultural fields and we could not record the mating.

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Teachers for Tigers: Training trainers for tiger conservation at Namdapha Tiger Reserve, Arunachal Pradesh

Rengasamy Marimuthu

US Fish and Wildlife Service sponsored a project on "Conservation education and capacity building on Tiger conservation in the protected areas of Arunachal Pradesh" is intended to provide Conservation education training to groups of teachers, non-governmental organisations, volunteers and capacity building training for forest front-line staff in Arunachal Pradesh. This report is about the trainers training programme for the educators.

Zoo Outreach Organization (ZOO) of Coimbatore, Tamil Nadu executed the training with the support and coordination of Namdapha Tiger Reserve; ZOO with the sponsorship of USFWS had conducted several teacher training workshops for tiger conservation named "Teachers for Tigers" in India and Bangladesh.

Mr. Sangay Dorji, Deputy Director, Namdapha Tiger Reserve inaugurated the training

Attitude assessment one of the methods to assess participants knowledge

Principal Investigator, ZOO, Coimbatore.
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Mini dramas on tiger courtship behaviour

The goal of the training was to create awareness on tiger conservation through education and training and the objective was to train educators to promote tiger conservation in Arunachal Pradesh especially in forest fringe areas of Namdapha Tiger Reserve. To fulfil the objective a three-day teacher training workshop for teachers, forest personnel, NGOs and interested individuals was conducted.

The tiger conservation education training was held on 11-13 December 2017 at Forest Rest House, Deban, Namdapha Tiger Reserve. A total of 33 teachers, Ngo's and forest departmental staff participated. Mr. Tajum Yomcha, Research Officer, Research Officer & local focal person welcomed the gathering. Mr. Sangay Dorji, Deputy Director inaugurated the training and in his inaugural address he mentioned that this kind of training is the first of its kind in Namdapha history and appreciated ZOO's efforts for planning a training in Northeast and requested the trainees to take part in the training passionately and learn the module and then take the training to your audiences both students and community who live in and around the tiger reserve. Mr. Hangkam Tungkhang and Mr. Mr. Likha Obi, Forest Range Officers also participated in the inaugural.

The "Teachers for Tigers" manual developed by Wildlife Conservation Society, Bronx Zoo was revised and used in the teacher training workshop. Tiger education packets were also developed which contains a booklet, mask, sticker, placard and wristband *(Rakhi).* The teacher training workshop predominantly used mini drama, games, academic activities, maps, personalities, stories,

Understanding tiger's historic and current ranges through maps

Observation game-participants comparing their jumping with tigers

debates, demonstrations, arts, and mock conferences to convey pertinent information on wildlife conservation, specifically tiger.

After the inaugural the three day training started with an ice breaking activity called “sound off”. Then moved on to tiger manual activities one by one covering the three days programme. The first activity was assessment strategies which includes concept map, attitude assessment and content survey method both pictorial and written. These methods are used to assess how the training program affects the trainees knowledge on tigers and their attitude about tiger before and after the training. All the assessment methods were used.

To introduce the aspects of tiger biology and conservation mini dramas were conducted. The participants were divided into four groups and each group provided with a script and explained about the rules they would follow during the performance. This was a miming drama. Only animal sounds were

Tiger timeline history posters drawn by participants put up in exhibition

Role play-farmers presenting their grievances to the politicians

allowed not human sounds. The themes of the dramas were courtship, hunting, poaching and parental care. Enough time was given for the preparation of property and rehearsal. They also provided with a drama kit which contains tiger and its prey animal mask to use in the drama. Once they were ready called to perform the drama. All the groups did well.

Followed this a map activity was done to understand historic and current tiger ranges. They were provided with maps of major habitats of Asia, historic and current tiger range maps and asked them to assemble it in proper way. After assembling they were asked to make a list of different countries that tigers were found in 100 years ago and list of the countries tiger are found today and also the different types tiger habitats and list out the tiger subspecies.

The next activity was from little cats to big cats to know about tiger adaptations and behaviours by comparing the domesticated cats which make convenient models for studying some of the characteristics of tigers. The observational activities include body size and height, jumping, hunting, climbing, camouflage, eating, tail, speed, territoriality and communication. Each activity was explained to the participants and volunteers tried the activities by comparing them with that of tigers.

The history of tigers taught to them through an activity called Tiger Timeline. The tiger date cards which has historic and current events was given to each participant and blank paper and colouring materials. They were asked to illustrate the data card event in the given paper as a drawing and colour it. After done,

Demonstration of utilisation of tiger education packets

each one of them explained to the other participants what the message their drawing trying to convey. Later all the drawings put up in chronological order as an exhibition. The exhibition says about the illustrated history of tigers from early 1700 to 2050.

The manual deals in unit 2 about global perspectives of tiger which includes tiger in our culture, tiger mythology, tiger in arts and global perspectives role play. To encourge participants to explore the perspectives on tigers around the world differs in their culture, as a first activity, was done. Many cultures around the world used the tiger as a powerful symbol. They used the tiger name in advertising, sports, stories/movies, songs, literature, animal and plant names. The participants were divided into different groups and asked them to explore the examples of above categories. We made this as a competition and announcing that group come up with more examples got rewarded in order to get more examples. Really the groups came up with more and more examples which shows the role that tigers have played in their culture. Then the participants went through the manual to know about tiger mythology, stories and tiger in art.

The next activity was global perspectives role play. In this activity participants took different roles of different people and view tigers in their perspectives. They were divided into advertising executives, biologists, farmers, newspaper reporters, politicians and song writers. Then sufficient time provided to prepare the role play. Then each group perfomed. The advertising executives presented their new product which carrying tiger name and promoted their product. The biologists read the letter which written to conservation organisation for funding for their tiger research, farmers made the grievance to the politicians to save from tiger conflict, newspaper reporter made a report to make people

Participants posing with certificates during validictory

aware of the major issues surrounding on tiger conservation based on his interview. Politician made a speech advocating a tiger conservation. And songwriters wrote a song on tiger conservation and sang with music. In the tiger conservation biology, they were told about feeding ecology of tigers and the problems tiger facing such as poaching and illegal hunting of tiger prey as people in tiger range countries should aware protecting prey species is critical to tiger survival. Moreover, they were taught about tiger conservation in India especially launch of Project Tiger, its history and current status, probably the largest and most ambitious conservation efforts in india and in the world and also counting tigers-census techniques such as pugmark method, camera trapping, genetic method and studying the home ranges of tigers by radio tracking method in detail.

As a last activity a mock exercise on International Tiger Conference was held. The participants were divided into different groups. Each group provided with seven tiger conservation strategies and 100 points. The group will assign the points equally to all actions or only selected actions according to their wish. The major actions include 1. conduct studies to monitor the size of the tiger populations and its prey in different regions of its range 2. Create new laws and policies to protect tigers on the ground 3. Reduce human impacts on tiger habitats 4. Create new laws and policies to reduce and control the trade in tiger parts and products 5. Implement and enforce laws restricting trade in tiger populations 6. Train people and build capacity for long-term management and 7. Promote education and public awareness. Each major actions has more secondary actions. This exercise helped them to know how the species management strategies were drafted in international conferenes with the help of all the stakeholders.

One hundred tiger education packets were given to the participants in order to practice what they learned out of the training by conducting tiger conservation education programme at the school or with the community. A demonstration was done by the trainers how to utilise the materials effectively at their audience. At the end the participants were pledged to help to save tigers by doing two education programmes within six months and they written it in a pledge card. At the validictory the participants received participation certificate.

The resource persons were Rengasamy Marimuthu, Senior Education Officer, Zoo Outreach Organization, Dr. B. A. Daniel, Scientist, ZOO, Mr. Shaik Hussain, Wildlife Consultant, Kothagudem, Andhra Pradesh and Tajum Yomcha, Research Officer, Namdapha Tiger Reserve.

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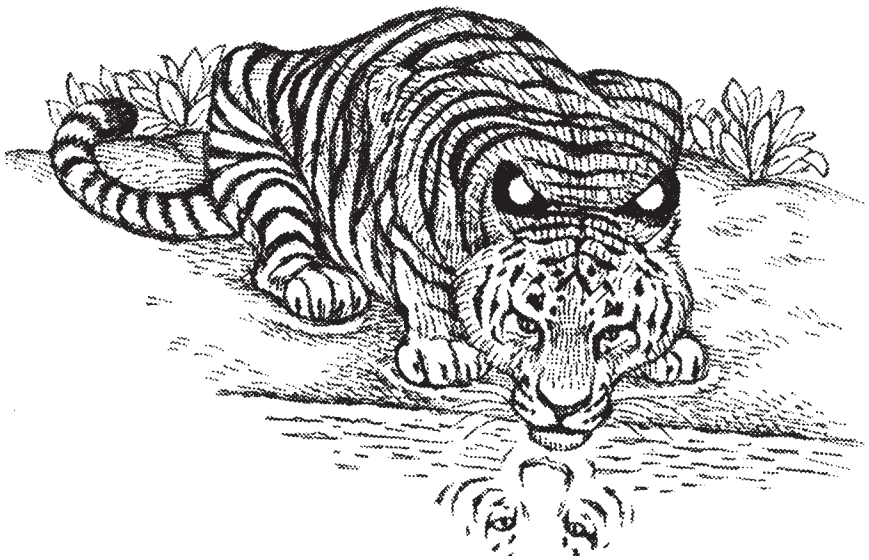

National Zoological Park observes the Environmental Days

The National Zoological Park, New Delhi observed the World Sparrow Day (20 March), the International Day of Forests (21 March) and World Water Day (22 March). Smt. Renu Singh, Director, National Zoological Park inaugurated the events with a brief note about the importance of the day. At the end of all events, a film shows was organized and lectures were given.

World Sparrow Day

During World Sparrow Day, a Zoo Walk was organized for school students, visitors and zoo staff. Director interacted with the participants and informed them about the role of youth in conservation of wildlife and environment and motivated the gathering.

After that Preeti Kashyal, CMS ENVIS Centre interacted with the participants about the day. Then, the Director distributed nest boxes along with pamphlets to the students and staff.

International Day of Forests

On this occasion, Dr. Naaz Rizvi, Director, National Museum of Natural History gave a lecture to the students of Bharati College, Mata Sundari College and zoo visitors. After that a Zoo Walk was organized. Then the Director interacted with the participants. Later, Mr. Ajit Kumar Bhowmik, Joint Director (Retd), NZP interacted with the participants and gave more information of the importance of the day. Then the guests

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Director, NZP distributing nest boxes

Zoo walk flagged off by the Director, NZP

An exhibition was set up at the zoo premise

Submitted by Ajit Kumar Bhowmik, Joint Director (Retd), National Zoological Park, New Delhi. Email: bhowmik_ak@yahoo.com

Pangolin awareness programme at St. Joseph's High School, Tirunelveli, TN

On 1 February 2018, Pangolin awareness programme was conducted at St. Joseph's High School. A total of 86 students, 7 teachers and other office staff participated. The Headmistress of the school felicitated the gathering. The chief guest, Dr. Selvin Samuel, Principal (Retd). St. Johns College gave a talk about the World Wetlands Day and RAMSAR Convention. He further stressed about the importance of conserving water bodies especially Veinthankuam and Thamirabarani Rivers of Tirunelveli, preserving biodiversity, amphibians and technology involving vermiculture.

Then Ms. Rani Kirubairaj, Retd. Botany PG Assistant conducted pangolin awareness programme. She selected 5 students from the group and asked them to read one page from the Pangolin booklet. Then they played pangolin puzzle – using the questions, they found answers for all except 2 words related to illegal poaching and illegal trafficking. The meaning of those words were explained in detail. Jenifa, Krishna Divya, Deepika, Bapisha, and Kaviya raised their doubts on pangolins. Do Pangolins have teeth? Will they bite us? Why do people kill them against law and order? How do Pangolins eat ants and termites without being bitten by them? are some of the questions raised. Appropriate answers were provided and they were encouraged.

The students shouted pangolin slogans. Then they took pledge to conserve, be kind, pass conservation message to others, stop poaching and to 'love' this innocent animal. Pangolin paintings were done by the class 5 & 6 students. The students in chorus sang a song on pangolin written by Rani Kirubairaj. They wore masks and holding placards mimicked like pangolin. They all took notes from the exhibited messages about Pangolin. All participants received memento for answering well during the quiz. The students liked the pangolin materials supplied by Zoo Outreach Organization, Coimbatore. They eagerly went through the poster, pamphlet, placard and stickers and learned about Pangolin.

Taking pledge to save pangolin

Submitted by Rani Kirubairaj, Email: ranijoel12@gmail.com

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planted saplings at the zoo campus. Saplings were distributed to the students and zoo staff as well.

World Water Day

The participants of the programme were Lady Irwin College, Arya Gurukul School, Ranibagh, Shanti Devi Gurukul, Sainik Vihar, Delhi students and visitors. Dr. Naaz Rizvi, Director, National Museum of Natural History gave a talk. The Director of NZP inaugurated the exhibition in collaboration with National Museum of Natural History. The exhibition was opened for public from 22 to 31 March 2018. Zoo Walk was also arranged.

Eco Tour to Koonthangulam Bird Sanctuary

On 24 February 2018 the winners of Environment Day competitions 40 students representing 15 schools and the National Green Corps Coordinator of respective schools were taken to Koonthankulam Bird Sanctuary as part of "Wild Walk Day". The forest department staff flagged off the event at Tiruneveli and addressed to the students about the importance of protecting the forests and its wealth – the plants and the wild animals. Further they stated that how forests are helpful to human-being, how they develop interest on wildlife by visiting sanctuaries, study them and taking part in animal census and trekking etc.,

Eco tour students participated in Pangolin quiz

Eco tour participants at Koonthangulam

Vijayalakshmi, Dist. Environment Awareness Coordinator, Tenkasi shared the students about the importance of the sanctuary in protecting birds. She asked the students to develop passion towards birds and do research projects on birds in your higher studies.

Selvin Samuel, District Environment Coordinator, Tirunelveli explained about the art of 'Bird Watching' and how to watch the birds without disturbing them, the bird trail and always maintain a bird notebook to note down whatever they see. Then the students were taken around the sanctuary to watch the birds. They were happy to see the trees with full of birds, nests, large pelicans flew over their head with fishes held at their long beaks.

Paul Pandian, Forest Bird Watcher shared his experience with the students. Then he told them some interesting facts about different birds and number of birds (339) visited this year. He sang a song related to bird characteristics which describes its colour, wing, leg, beak size, nature of nesting on ground and trees. Students enjoyed the song very much.

After bird watching, Rani Kirubairaj taught the students about Pangolins using ZOO materials and followed by quiz, song with folk dance "Kolattam" and took a pledge to save the animal.

Sudhakar Issac, S., Associate Professor, Dept. of Zoology, St. Johns College, Palayamkottai gave a talk about 'Bats'. He talked about the role of bats in the forest formation, development and sustenance. Zoo Outreach Organization's 'Bat Count' pamphlets were given to all the participants. Students interacted with him by asking more questions on bats.

Forest Range Officer Palanisamy and Muniandi did all the arrangements.

Submitted by Rani Kirubairaj
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Learning about Spiders at Sundarvan

Welcoming the children for the Winter Night at the zoo

Winter is the perfect season to be outdoors and explore. Sundarvan organized overnight stay at the zoo for 8-12 year old to instill a passion for nature. Seven sessions conducted with average participation of 25 kids in each from November 2017 to February 2018.

The objective of the programme was to learn about nature, wildlife with special emphasis on the lesser charismatic fauna such as spider.

Participants with their creative art

The children were welcomed on Saturday evening with an icebreaking activity. To evaluate students attitude towards spiders a chart was made depicting five emotions which was represented by icons. The children were asked to put down their names under the relatable emotions they share about spiders. The same activity was repeated at the end of session to evaluate the impact of the programme. The quantitative measure of

Children took a keen interest in the night trail observing nocturnal movement

the activity has enabled us to conclude that 61% of the kids' emotions have shifted to positive after the session.

The programme was loaded with art activity, interactive presentation exploring the world of spiders, night trail to view spiders, camp fire, animal yoga and morning trail to explore other life forms and diurnal spiders**.** There were small interactive activities in between to keep the children attentive. Stories about Greek mythology and classics were exchanged around the camp fire along with other games. The group called it a night with endless excitement for the next day.

The next morning started with a yoga session influenced by various animals' posture. The activity was lead by a resource person who has immense knowledge of yoga and could relate it to animals and plants world for the children to inculcate their interest. The morning trail concentrated more learning about birds, bats and reptiles.

The children were handed with a pictorial checklist of common spiders to try their hand to identify the spiders when we sight during the trail. Almost six varieties of commonly found spiders (eight) of Sundarvan were sighted during each trial.

The intricacy of the tent spider's web, web-less spiders and holding slough of large spiders like huntsman ignited the spark in the children's eye. The children let out wondering surprised gasps, trying to record photos of their newly achieved experience.

We owe much gratitude to our team of volunteers Isha Parekh, Neel Kamal Panchal, Kaushavi Patel without whose energy and charisma this event would have been incomplete.

Submitted by S. Sivakumar, Park Manager, Saymanti Bandyopadhyay, Education Officer, Sundarvan and Meena Nareshwar, Senior Programme Co-ordinator, Centre for Environment Education. Email: s.sivakumar@ceeindia.org

Celebration of World Sparrow Day at Jhansi, UP

Every year World Sparrow Day is being celebrated all over the World on 20th March since 2010. This year Indian Biodiversity Conservation Society (IBCS) resolute to involve as many volunteers as possible so as to involve the younger generation in the conservation of House Sparrows. For this the schedule was planned out from December 2017 to March 2018. The aim for selecting these four months was in accordance to the onset of breeding period of House sparrows that starts from February onwards. In the month of December the artificial nest boxes were prepared with the shoe boxes that are a waste and usually thrown away. The earthen pots were also prepared with the help of local potter. The entrance hole of 3-3.2 cm diameter was made in the pots before baking them. The installation of nest boxes started by December end with the involvement of local people, with parallel sessions of awareness programmes. The installation was done much before the breeding period so that the sparrows get use to the artificial nest boxes and adapt them readily by February. For organizing awareness programmes, awareness material (Flyers in Hindi and English, Posters, artificial nest boxes) were provided to the volunteers mainly the teachers of Government schools. They were instructed how to systematize the programmes in the schools. The teachers also organized various competitions amongst the students like colouring competitions, quiz on House Sparrows. These activities assist the students to concentrate on the issue that they being involved in. The volunteers demonstrated the preparation of artificial nest boxes to the students. They also installed the nest boxes in the schools so that the students installed them rightly in their houses. These nest boxes have been adapted by the House Sparrows. On-site awareness and conservation programmes enhance students' experiences and simultaneously help build support for the House Sparrows. Artificial nest boxes were distributed amongst the students and school staff. The monitoring of the nest boxes and watching the birds accepting them as their new houses proved to be the best way to sensitively involve the students in the conservation of House sparrows. Some

Traditional Pot maker is preparing artificial sparrow nests out of clay

Students participated in sparrow colouring activity

Submitted by Akhilesh Kumar, Sonika Kushwaha and Pallavi Gupta, Indian Biodiversity Conservation Society, Jhansi-Uttar Pradesh. Email: ibcsforall@gmail.com

of the volunteers also organized awareness programmes in their societies, involving the children of all age groups. The students took oaths to save sparrows and to maintain a suitable habitat for them. The distribution and plantation of bushy shrubs and thorny trees were done in the last week of February and first week of March. Wherever possible, the school staff and people were provided with the earthen pots so as to provide water for the birds. Hence the team members of Indian Biodiversity Conservation Society tried to cover all aspects associated with the conservation of House Sparrows such as nesting, roosting, foraging sites and water availability. The press media was furthermore involved to take the message to the public with an appeal to count the House sparrows in their homes on 20th March. The response was positive and people reported about the sparrows at their homes. Many of them were also interested in installing the artificial nest boxes in their homes. The efforts of Sahib Singh, Shailendra Yadav, Tilakram, Sharla Maurya, Mamta, Vinay Kumar, Aman Yadav, Abhishek Namdev, Neetu, Archana, Saurabh, Nikhil, Rakesh, Shivam Pandey, Anand Yadav, Jyoti, Dilip, Sachin, and Sanskar are highly appreciable.

World Sparrow Day at University of Lucknow

Biodiversity and Wildlife Conservation Lab, Department of Zoology, Institute for Wildlife Sciences, University of Lucknow in collaboration with Uttar Pradesh State Biodiversity Board and Regional Science City, Aliganj, is celebrating Sparrow Day from 2010 onwards and also started an initiative named "*Gharaunda 700"* since October 2015 with an aim to install 700 sparrow nest boxes in the city every year.

Till now we have installed thousands of nest boxes in Lucknow and other districts of Uttar Pradesh:

In 2015 - 700; 2016 - 500; 2017 - 900 nest boxes were installed). Our goal for the year 2018 is to install 450 nest boxes in Barabanki, Sitapur, Gonda, Hardoi districts.

For this the volunteers of the lab distributed around 2100 nest boxes in the city and spread awareness in about 2000 schools in the last two years.

In 2018, with the collaboration of Uttar Pradesh State Biodiversity Board and Regional Science City, Aliganj, Centre for Biodiversity and Wildlife

Rangoli made by the participants

Research and Conservation, Lucknow we celebrated Sparrow Week from 18 to 20 March 2018.

Prof. Amita Kanaujia along with research scholars and volunteers of Biodiversity and Wildlife Conservation Lab, we organized three-day awareness programmes and celebrated World Sparrow Day with great enthusiasm. The team reached about 15,000 people and created awarness about sparrow conservation.

Nest box distribution stall
A stall for nest box distribution and mass awareness on 20 March 2018 was inaugurated by Prof. Padma Saxena and Prof. Amita Kanaujia, University of Lucknow. Approximately 450 nest boxes, 100 plants and 200 earthen pot were distributed in public for the care and betterment of house sparrow.

Signature Campaign
A signature campaign for Sparrow Conservation was also held on 20 March 2018 in front of the main gate of Regional Science City. General public enthusiastically gathered while the volunteers explained the ways to conserve sparrow.

House Sparrow Photo Exhibition: By Rajeev Rawat
Because of our efforts people have started showing interest in Sparrows and started installing artificial sparrow nests at their houses and surrounding areas. Inspired by this thought one person in Lucknow, Mr. Rajeev Rawat has captured photos at his own house and presented a beautiful Sparrow Gallery.

Competitions at Regional Science City
On 20 March, 2018 various programmes such as poster, rangoli and quiz competitions were organized in Regional Science City campus. Approximately 300 students from Gurukul Academy, CMS Mahangar, Bright way Inter College, Luknow Public School participated in the competitions. Prof. Padma Saxena, Prof. MadhuTripathi, University of Lucknow, were the guests for the valedictory function.

The programme was successfully closed by prize distribution to the winners of different competitions.

Submitted by Amita Kanaujia and Adesh Kumar, Biodiversity & Wildlife Conservation Lab, Dept. of Zoology, Institute for Wildlife Sciences, ONGC Center for Advanced Studies, University of Lucknow, Lucknow. Email: kanaujia.amita@gmail.com

Sparrow photo exhibition by Rajeev Rawat briefed by the experts

Professor Ratan Lal Brahmachary

Ratan Lal Brahmachary (1932 - 2018)

Professor Ratan Lal Brahmachary, distinguished biochemist and a pioneer of tiger pheromone studies in India, died in the wee hours of morning on 13 February 2018 in a nursing home in Kolkata, India. He was 86.

Widely known for his research in pheromones, the biochemical messengers in living organisms, Brahmachary made significant contributions in tiger behavioural studies researching the animal for over 50 years.

Interestingly, he was an astrophysicist by training and a student of eminent Indian theoretical physicist Satyendra Nath Bose. Brahmachary shifted streams to study pheromones at the Indian Statistical Institute under its founder Prasanta Chandra Mahalanobis. He studied many species of wildlife, notably big cats, and undertook research trips to his favourite continent Africa fourteen times.

An ardent admirer of entomologist Gopal Chandra Bhattacharya, Brahmachary studied ethology in the Amazon basin in South America and Borneo, Indonesia. He was among the first scientists to observe the scent-marking behaviour of tigers, where the animals spray urine on tree branches to mark their territories and communicate via biochemical messengers. Synthesising the chemical nature of tiger urine (marking fluid), Brahmachary, alongwith Jyotirmoy Dutta of Bose Institute, Kolkata made the first comprehensive approach towards understanding the nature of big cat pheromones.

Brahmachary's research found out that the molecule 2 acetyl-1-pyrroline (2AP) was present in tiger urine (marking fluid) and was the very same molecule that imparts the beautiful aroma to fragrant varieties of rice like basmati.

The biochemist was assisted in his studies on tiger pheromones by former Prime Minister of India, Indira Gandhi, who supported his scientific investigations. When Brahmachary was looking for a tiger cub to study pheromonal communication, Gandhi famously responded, "So you want a tiger cub?", and later facilitated his research on tigers, both in captivity and wild. An inveterate traveler, Brahmachary forged celebrated friendships with conservationists and animal welfare professionals from across the world.

Ratan Lal Brahmachary with tiger cub Sabita and Katyayani photograph by Sally Walker

He wrote several books in Bangla to promote the cause of wildlife protection and scientific observation of animal behaviour, including '*Africar Jongoley Barobar*'('Twelve Visits to the African Jungle') and '*Bagh, Shingha, Haathi* ('Tiger, Lion and Elephant'), receiving the coveted state prize of Bengal, the Rabindra Puraskar, for his contributions to science popularisation. His book 'My Tryst With Big Cats' is quite popular among tiger studies scholars. He also wrote 'Animal Behaviour' a remarkable book on ethology for Indian students.

A founder patron of Zoo Check, now the Born Free Foundation, Brahmachary always emphasised that wildlife belongs in the wild and strongly stood for compassionate treatment of animals in research. "Biology is as fascinating as probing the mysteries of the physical universe. The inner universe of an organism or of an ecosystem is as challenging as the outer Universe of the expanding cosmos," he once said in an interview. His research on tiger pheromones was published in the March, 1988 issue of ZOOS' PRINT magazine.

A life-long bachelor, Professor Ratan Lal Brahmachary had pledged his body to medical research.

By Shubhobroto Ghosh, Wildlife Project Manager, World Animal Protection in India, the author of the Indian Zoo Inquiry. Email: sgpowerofwords@gmail.com

ZOO'S PRINT

Communicating science for conservation

ZOO's PRINT Publication Guidelines

We welcome articles from the conservation community of all SAARC countries, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and other tropical countries if relevant to SAARC countries' problems and potential.

Type — Articles of semi-scientific or technical nature. News, notes, announcements of interest to conservation community and personal opinion pieces.

Feature articles — articles of a conjectural nature — opinions, theoretical, subjective.

Case reports: case studies or notes, short factual reports and descriptions.

News and announcements — short items of news or announcements of interest to zoo and wildlife community

Cartoons, puzzles, crossword and stories

Subject matter: Captive breeding, (wild) animal husbandry and management, wildlife management, field notes, conservation biology, population dynamics, population genetics, conservation education and interpretation, wild animal welfare, conservation of flora, natural history and history of zoos. Articles on rare breeds of domestic animals are also considered.

Source: Zoos, breeding facilities, holding facilities, rescue centres, research institutes, wildlife departments, wildlife protected areas, bioparks, conservation centres, botanic gardens, museums, universities, etc. Individuals interested in conservation with information and opinions to share can submit articles ZOOS' PRINT magazine.

Manuscript requirements
Articles should by typed into a Word format and emailed to zooreach@zooreach.org. Avoid indents, all caps or any other fancy typesetting. You may send photos, illustrations, tables.

Articles which should contain citations should follow this guideline: a bibliography organized alphabetically and containing all details referred in the following style: surname, initial(s), year, title of the article, name of journal, volume, number, pages.

Editorial details
Articles will be edited without consultation unless previously requested by the authors in writing. Authors should inform editors if the article has been published or submitted elsewhere for publication.

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