

August Issue -xxxv 2023

JUNGLE RHYTHMS

BIG CAT TALES

06 COVER STORY
The Unusual
Life of P 212

14 COVER STORY
Palamau Tiger
Reserve

78 EVENT
Jungle Rhythms Awards
2023



Jungle Rhythms celebrating 50years of Project Tiger

Environmental protection is a fundamental duty of every citizen of this country under Article 51-A(g) of our Constitution and it reads as - "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures."

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Indian sub-continent is a unique land of rich biodiversity and culturally beautiful people. We have diverse ecosystems and life forms, vivid colours, songs and languages in the natural world. We have been living in harmony with our wild neighbours since ages and continue to have a deep cultural influence from wild life and nature. Respect for nature's processes is a way of life.

This fine line of tolerance is being tested every time our increasing population have experienced the 'modern day hardships and challenges'. The aspirations of becoming a global economic power have also pushed countless infrastructure projects, some of which leading to natural disasters, ecological imbalance and direct climate impacts. With shrinking forests and ever-eroding legal protections, the space for wildlife is now squeezing by an ever-tightening ring of human habitation, roads, mines, agricultural farm lands, industries and defense demands. Due to less space, animals have started dispersing out from their congested 'little forests' in search of new habitats. Many jungle corridors and forests patches through which they travel are now overgrazed, over-utilized or fragmented by roads, dams, rails or human homes. Many non-protected habitats and migratory routes are now fragmented and lost. The incidents of road kills of tigers and other wildlife have increased. Territorial fights among wildlife have intensified. There is now a rise in tension and conflicts leading to livestock predation and loss of life.

There is a need for strong commitment, collaboration and action. Let us plan on this 50th year of Project Tiger to balance commerce, environment and biodiversity conservation in a sustainable way. It will ensure our better quality of life, ecological balance and our rich wildlife will continue to thrive in our forests. 

Nirmalya

The Jungle


U ntil the dark
 let the kakad bark
 as the sun slips down
 where horizon ends
 and the darkness descends
 the jungle wakes up
 to the howls of the jackals,
 the music of the crickets,
 the hoots of the owl,
 and then suddenly to the toot of the cheetal
 and the honk of the sambar I stiffen in my track
 now as the twigs crack
 under the footfalls of 'Baagh'
 for the king who lurked
 hiding from his prey
 in brown and grey
 has been seen and the jungle
 reverberates with lifesaving calls.
 alarming others beware don't fall
 a zephyr rustles
 through the moyan leaves
 touching gently my cheeks
 a snake slithers past my toes
 brings sweat to my brows
 Oh! it was so close then like it all had begun,
 suddenly thejungle goes quiet
 Now it is only me and the
 heavenly light
 not even a murmur is heard



Dr. Suhas Kumar

except for the crickets' chord and at
 this time,
 I imagine the ghosts,
 hear banshee behind my back
 stopping in my track
 brushing aside the game
 my mind wants to play
 I find a ledge overlooking the valley
 from where I see the silhouettes of
 hills, thickets and trees,
 a huge lake spread before me
 washed in the silver
 that pours from the sky
 and looking at the hoary moon,
 counting countless stars,
 I listen to the whispers
 of a gentle breeze
 and all this happens in my crease
 I am the jungle of Pench Suhas
 Kumar, 2012
 Kakad- Barking deer Moyan-
 LanneacoromandelicaBaagh - Tiger

— Dr.Suhas Kumar retired as Principal Chief Conservator of Forests from the Madhya Pradesh Forest Department. He spent 23 years of his 35-year-long service, managing, supervising, and guiding the management and training of the officers and staff of national parks, sanctuaries, and tiger reserves of the state. He worked as the Director of Pench National Park for 5 years in its formative period from 1985 to August 1990. He headed the Wildlife Extension Faculty at the Wildlife Institute of India, Dehradun, from 1990 to 1996 and contributed to the growth of the training and publishing capabilities of WII. He is a trained wildlife manager, a law graduate, and a Ph.D. in the field of ecotourism in protected areas.

He is a member of WWF-India's State Advisory Board for Madhya Pradesh and Chhattisgarh, the Governing Body and Governing Council of the National Centre for Human Settlement and Environment, Bhopal, and the Delhi Biodiversity Society. His write-ups, research papers, and case studies have been published in books, magazines, newspapers, and web media. My most recently published book is - 'Nature's Disciple'. It is available in eBooks and paperback formats. 



THE TIGER THAT LOST ITS FANGS: THE UNUSUAL LIFE OF P 212

Dr. Suhas Kumar

The successful reintroduction of tigers in the tigerless habitat of Panna, which had once harboured around 35 tigers, was no ordinary feat and for this superhuman effort, everyone from the watchers to the top bosses must be praised and applauded. Yet, the most constant source of leadership that oversaw the resurrection of tigers in Panna was of course R. Srinivas Murthy – now fondly called ‘the Tiger Man’ by many.

In the process of repopulating the reserve many tiger myths were demolished, several new insights into tiger behaviour and their movement patterns became available and even marked differences in the behaviour of the tigers reared in captivity were observed when they were released in the forest to live a life of freedom.

I have been closely following the wonderful work done by Murthy even when I was in Human Resource Development and later in the Protection wing of the department from 2010 to March 2012. Something unprecedented was happening in the field of wildlife conservation and I wanted to tell that to the entire world so in May 2011 I sent an email to Murthy requesting him to send me a note on his efforts as I wished to nominate him for a prestigious Award. Typical of Murthy, I received a terse reply – “I do not work for rewards and awards and I do not want any”. I wrote back to him that I needed that note urgently because I wanted to tell the whole world about the wonderful work foresters were doing at Panna. He relented and sent me a three-page write-up. Based on that I developed a nomination proposal for WWF-PATA Bagh Mitra Award and sent that to the Secretary General of WWF-India. About some months later I received a letter from Ravi Singh, the Secretary General of WWF-India informing me that my nominee was chosen for that Award. I gave the good news to Murthy immediately. And I am sure after receiving that Award Murthy became a little amenable to accepting awards as he claimed several more in coming years.

As by late 2011, the first-generation cubs at Panna has already grown up, I was extremely concerned about their safety. In a few months, they would be ready to disperse beyond the tiger reserve’s core area as till then the buffer was not notified and the area beyond the core was managed by territorial divisions. Territorial divisions work under different sets of objectives though all ranks of officers managing their respective territory are legally designated Wildlife Wardens under the Wildlife Protection Act and therefore



PC: R. Sreenivasa Murthy

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PC: Panna Tiger Reserve

responsible for protecting and managing wildlife and their habitats within their jurisdictions. Unfortunately, in those days it was an unwritten policy of the wildlife wing to leave the territorial forest officers alone in the matters pertaining to wildlife management, and that approach of the seniors in the wildlife wing was the real cause of my unease. I discussed this with the Head of the Forest Force (HoFF) and sought his time to make a presentation on the importance of roping in territorial divisions to take care of the tigers. With his permission, I made a presentation on 23 April 2012 before three PCCFs (HoFF, Wildlife and IT). The HoFF agreed to my suggestion and in May 2012 a Tiger Task Force headed by APCCF (Protection) was created to oversee and guide the management and protection of grown-up tigers dispersing from the Panna tiger reserve into adjoining territorial divisions. These divisions were also given funding support from a specially created state Plan head for the protection and management of wildlife outside protected areas. This fund was effectively used to train and equip the territorial staff in wildlife protection and monitoring

During this phase, an interesting story was churning out in Panna. It was about a tiger that was to suffer a series of adversities without taking it to heart and coming out of those misfortunes with remarkable resilience. He was a maverick and an adventurer, and he was a winner who lived his life to the hilt. This story is about a tiger P 212 that was born to Tigress T2 a founder female brought from Kanha. The name 212 is a code name- the first digit reveals to which female a cub belongs and the second digit tells the litter number of that female. So, P 212 was one of the 4 cubs born to T2, which was its first litter, in October 2010. One of the female cubs perished and three survived.

His brother P211 was an explorer and once he created quite a flutter when he made a forest area, in Lalitpur district of Uttar Pradesh almost 130 km from Panna, his temporary jurisdiction to the chagrin of the then CWLW Uttar Pradesh. His exploits will be told in another story.

P 212 and his siblings had a short tenure with her mother T2. They were weaned off in just one year and five months in March 2012. Soon, he was ready to explore the world beyond. P 212 got his first radio collar on 13.5.2012 as all first-generation young tigers were fitted with collars to monitor and understand their movement pattern. P212 (18 months) moved out of the national park on 3 August 2012, crossed the Uchehra plateau and reached Pangara village of Satna district. Murthy's



team tracked it and he was brought back to the reserve on 5 August 2012. His non-functional radio collar was changed on 22.3.2013

He lived happily in the reserve without any noticeable twist in his life until one day he tried to tackle something much bigger and powerful than himself. P 212 had a daring attitude; he was always ready to subdue prey much larger than his own size. One day in late March 2013, he tried to tackle a bull but in return, the experienced bull gave him a nasty puncture on the right flank just near the area where the shoulder joins the torso. From the outside, the wounds did not look threatening. The Reserve's vet Dr. Sanjiv Gupta hoped that these wounds would heal naturally; yet to keep away infection and to assist healing he administered some antibiotic shots from the dart gun and the staff continued monitoring the animal. But within a week they found that the wound had festered. Murthy called and requested me to send Dr. A. B. Shrivastava from Wildlife Forensic and Health Centre, Jabalpur to inspect and treat P 212. I immediately talked to him. Dr. AB Shrivastava, readily agreed to come along with Dr.Chanpuria a renowned veterinary surgeon. I facilitated their visit.

Both doctors reached Panna on 3 April 2013 they immobilized the tiger and inspected the wound. They found that actually the bull had wounded the tiger not at one but several places on the chest and on both left and right flanks. Wounds were deep and infected. Besides, the maggots had made inroads into the muscle. They cleaned, medicated and sutured the wound but P212 needed regular supervision and cleaning of wound. Murthy consulted the doctors and decided to shift P 212 to a smaller improvised 1-hectare enclosure within the larger enclosure erected earlier at Badgadifor soft release of the founder tigers. (A soft release enclosure is built to provide sufficient time to an animal brought from other area to adjust and adapt to a new environment before it is released into a new habitat.)

But, next day when Dr. Sanjiv went to assess the wound he found swelling in the right shoulder and leg. This was bad news. The tiger needed further care and treatment under close supervision. Dr. Sanjiv shifted him to a cage and gave necessary medicines. This arrangement misfired, the unhappy tiger fought with the iron rods of the cage in an attempt to escape and in this process broke both

his upper canines. When this came to light, Murthy got worried. He was doubtful whether such animal could fend for itself if released in the jungle. He rang me up and we discussed the pros and cons and decided a course of action. As the tiger already had a radio-collar on him, we decided to release him and keep a close watch and if we found that he was unable to make a kill and eat it or defend himself, the vet could easily recapture and send him to the zoo. By April 25 2013 the wound was almost healed and to our great delight 3 days later he killed its first wild prey (a male Nilgai).

After successfully emerging from the ordeal, P212 freely roamed around the reserve, and one day (on 10. September 2013) he decided to walk to Jhalar village. Jhalar was a half-empty village inside the reserve and a large part of it was already vacated by the villagers who had willingly accepted relocation to a place outside the tiger reserve? Some families did not leave and demanded a better package. Here, just at the outskirts of this village, in a patch of forest, P212 met a village dog. A guard, who happened to be on patrol, was sharp enough to catch them in his mobile camera hobnobbing as if they were long-lost friends. But as it turned out, the dog tricked the tiger, ran behind him and bit his tail. As soon as the news of this hilarious incident, along with the funny picture, reached the FD and the vet, they were not amused but alarmed. A rapid investigation revealed that the dog was rabid and the villagers had later killed it. A postmortem was conducted and the brain tissue was sent to the lab for confirmation of rabies.

As there was ample reason to believe that the dog was sick with a deadly virus the vet decided to administer 6 doses of anti-rabies vaccine to P212. Over more than a month the vet meticulously administered those 6 doses following the vaccination schedule.

I am so very proud of the Veterinarian working in M.P.'s protected areas because I consider them among the best vets of the world. Their experience is formidable and their dedication to the job is par excellence. This particular case is an example of their knowledge and field craft. As the rabies vaccine must be administered subcutaneously - between the skin and the muscle, to achieve that much penetration short needles are used, but the needles used in dart guns are long. To overcome this Dr. Sanjiv used plastic sleeves to effectively shorten the needle ensuring subcutaneous delivery- all the 6 doses were administered

Dr. Sanjiv had a larger share of immobilization experience because of his posting in Panna; so far, he had the opportunity to immobilize 61 tigers for the purposes of treatment, rescue or relocation, besides he has immobilized and rescued 86 other wild animals. Other vets in the wildlife wing has their own long lists of accolades.



PC: CWLW

remotely using a dart-gun. Dr. Sanjiv had a larger share of immobilization experience because of his posting in Panna; so far, he had the opportunity to immobilize 61 tigers for the purposes of treatment, rescue or relocation, besides he has immobilized and rescued 86 other wild animals. Other vets in the wildlife wing has their own long lists of accolades.

So, our friend P212 survived the deadly virus, too, and lived happily in the reserve till he was bitten by the wander bug, once again. This time he probably followed a route that most tigers of an earlier era might have used to hop from one tiger habitat to another (now unmindful and ecologically unsound development projects have extensively damaged these pathways). His absence was noticed by the tiger reserve staff in the last week of March 2014. At that time Murthy was in dire shortage of field staff especially Range officers. He called a Range Officer Tushti Singh - she had joined recently, and deputed her to track P 212. She proved to be efficient and tenacious. She followed the tiger from Panna to about 25 kms short of Bandhavgah tiger reserve. The Tiger spent the night of 28 March at the same spot as he was dissuaded from proceeding towards Bandhavgarh by the bright lights of a cement factory and decided not to venture further towards Bandhavgarh. From there he turned north, skirted the edge of the Kaimur range and on 29 March 2014 reached a village in Rewa district and made himself comfortable in a crop field. The tenacious Tushtisingh was not far behind.

In the morning when people discovered that a tiger in resting in a farm, a huge crowd gathered. A faction of that crowd was ready to take on the tiger and finish him off. Another Range of officer present on the scene was Manju Uikey; she took charge of the situation and along with a local guard and a conscientious villager stood their ground and kept the crowd at bay till the rescue vehicle and the wildlife veterinarian Dr. Sanjiv reached the spot. Murthy and the vet were in constant touch with me over phone. Murthy wanted a direction whether P212 should go back to Panna? I discussed this with the CWLW and we decided to send P212 to restock the poor tiger population of Sanjay tiger Reserve, where, after several years of no-management an energetic and far-sighted Officer- K. Raman- was



PC: Panna Tiger Reserve

posted as Field Director. As the signal from P212's collar was weak, Dr.Sanjiv changed the radio collar and then transported him to Sanjay tiger reserve. P212 was released in Sanjay on 30 March 2014. He was now trying to adjust to a new prey-deficient habitat. In Sanjay, his diet mainly consisted of cattle. At that time there were one male and two female tigers in the reserve. Soon P 212 found the females and started courting them. He sired 8 cubs from 2 tigresses.

But ill luck never stopped following him as just after 3 months of his arrival in Sanjay he developed a wound on the neck perhaps due to attrition of the skin from the radio collar, but nobody in the reserve had noticed it till 30 July 2014. On 30 July 2014 a team of vets- Dr.Sanjiv along with Dr.Shrivastva the head of the Wildlife Forensic and Heath Centre, Jabalpur and Dr.G.Areendran, Director-IGCMC & IT WWF-India had assembled to immobilize and replace the damaged satellite collar. When the collar was removed a gaping maggoty wound shocked everyone present. The vets treated the wound and they all concurred to postpone recollaring till the complete healing of the wound.

Soon, bad luck entangled him once again and this time the local people began holding him responsible for the killing of a man in East Beohari Range on 21.12.2014, but the investigation revealed the presence of another tiger in the vicinity of the place of incident.

Sanjay tiger reserve was in good hand after decades of neglect. I wanted to take full advantage of this change. I mooted a proposal to start a research project with two aims – first to carry out research on tigers and second to inculcate scientific temper in the young forest guards and range officers and arouse their interest in wildlife. The aim of the research project was to study the home ranges, habitat use pattern and ranging pattern of resident and introduced tigers. So, I discussed this with Dr.K.Sankar, Senior scientist at WII, Dehradun and a proposal was developed and implemented. One of the requirements was to radio-collar some tigers and once again P 212 was chosen as one of the candidates; he was immobilized for the 8th time on 7 may 2015 and a new radio-collar was tied to his neck.

Alas! P212 could not help the research team with data from his collar



PC: Dr. Suhas Kumar

for long as just after two and a half months, he was found dead on the morning of 20.7.2015 in compartment 230 of Regna Patpar beat of Beohari range. A team of Veterinarians assemble again, but not to give him another lease of life but to find the cause of his death. The doctors concluded that the animal had died almost 40 hrs earlier and, on its body, there were multiple maggot-filled wounds. The viscera showed extensive haemorrhaging, especially in the sternum region. They expressed the possibility of a fight with another animal. The killer tiger's image was captured in a camera trap on 26 July 2015.

Our Hero died out of turn at the age of about 4 years and 9 months and during this short span of time, he was tranquillized 8 times to keep him safe. Alas! Nature has its own ways and we humans mostly fail when Nature decides to take over, we are happy that P212 has left his genes behind and his progenies will carry his legacy and continue to fill the land with more and more tigers. Amen!



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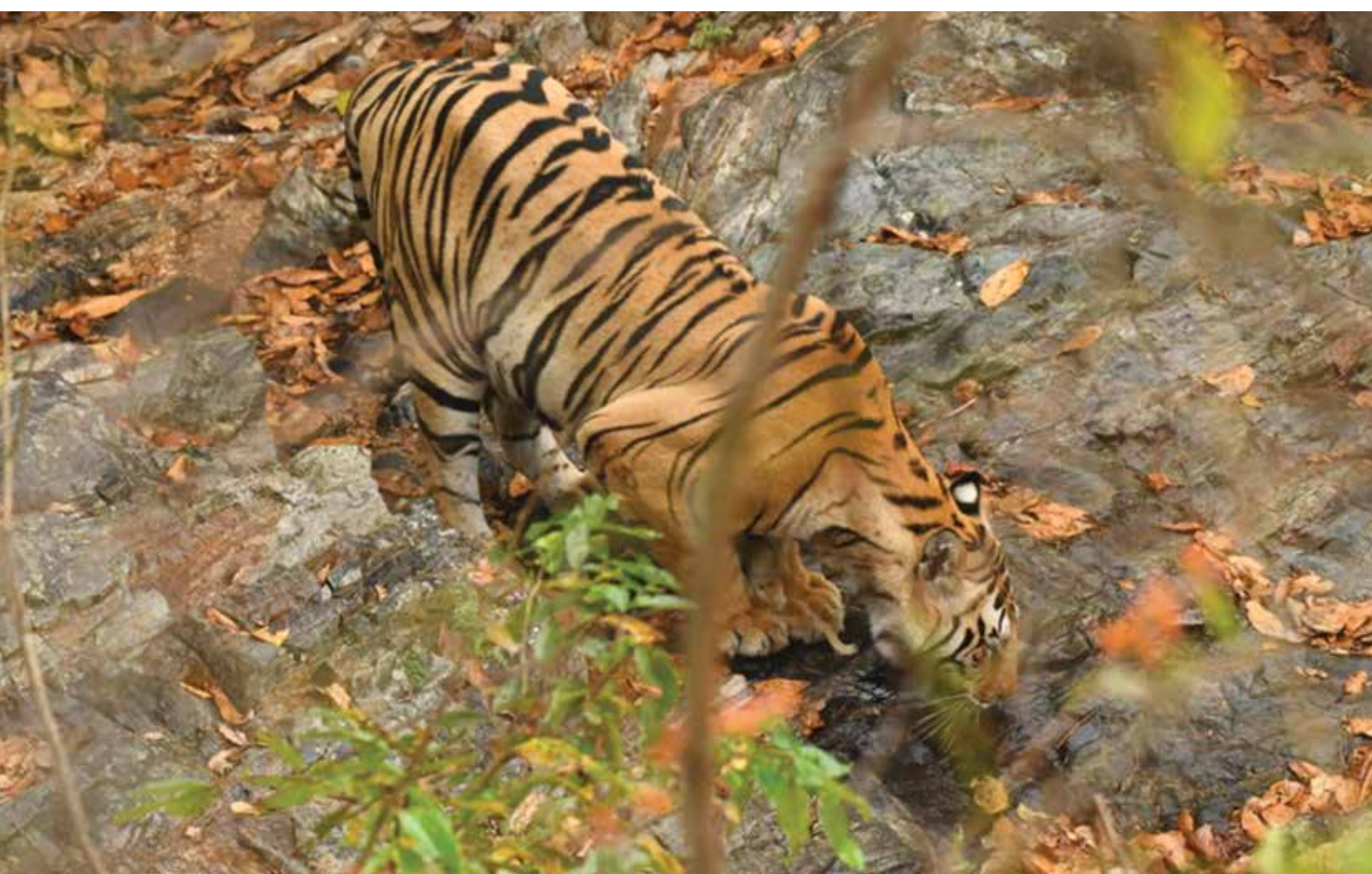


Palamau Tiger Reserve

■ *Shri Pradeep Kumar, IFS (Retd.)*

Nestled quietly in the arms of enchanting Vindhyan hills and in the vividly decorated mesmerizing valley of North Koel, Auranga and Burha rivers the Palamau Tiger Reserve (PTR) holds the proud distinction and acclaimed privilege of being one among the first nine tiger reserves of the country when the project tiger was launched in November 1973 in India. Extremely captivating and sheer beauty of the landscape

with its vast spread lush green Sal forest with loving hills & hillocks, cascading water-falls, gurgling streams, chirping birds and singing rivers having an unheard melody of eternity alongwith its variety of colourful wildlife give it a distinction of super creation of mother Nature. De facto the entire area stands as a fortress, an abode to innumerable and valuable species of flora and fauna and thus in true sense a real paradise for a forester, a biologist or an ardent nature lover.



With the passage of time this beautiful landscape experienced the turbulence and turmoils of various uncalled for and undesirable factors including the immense biotic pressure. These unwanted factors in course of time have tried to erode the glory of the land leading to the deterioration of the wildlife habitat of the area which has adversely affected the population of tigers, its predators and other wildlife. But the good thing and the radiating optimism envisage that there is tremendous potential and capacity in the biological entities of the area to come back to its glory and grandeur if the region is properly taken care of.

Connectivity with other wildlife corridors

1. Western side — Sanjay — Dubri Tiger Reserve of Madhya Pradesh through Guru Ghasidas National Park, all the way to Bandhavgarh Tiger Reserve. This makes it a part of 25000 Sq.Km of Bandhavgarh — Sanjay Dubri — Guru Ghasidas — Palamau landscape. Also connected to the Achanalamar — Kanha Tiger landscape through the Jashpur and Mahan Forests of Chattisgarh.
2. North-East side weakly connected to Gautam Buddha Wildlife Sanctuary and Koderma Wildlife Sanctuary along the border with Bihar through the Lawalong Wildlife Sanctuary in Chatra district as well as the Hazaribagh Wildlife Sanctuary.
3. South — connected to Saranda/Odisha landscape through the forest of Simdega & Palkot Wildlife Sanctuary in the Gumla District and thus this way also it is connected

This area could form one of the largest contiguous tiger habitats in Central India and PTR has the potential to be revived into a source population that supports a stable meta population of tiger across adjoining landscapes and revitalizes them with tigers and other wildlife in future



to the Simlipal Tiger Reserve through this wildlife corridor,

This area could form one of the largest contiguous tiger habitats in Central India and PTR has the potential to be revived into a source population that supports a stable meta population of tiger across adjoining landscapes and revitalizes them with tigers and other wildlife in future.

The Forest

The average density of the forests of the PTR are as follow :

- (i)Core Area 0.50 to 0,80
- (ii)Buffer Area — 0.30 to 0.50

The core area has high level of Sal forest coupled with open grasslands and riverine beds formed by North Koel & Burha river. According to Champion and Seth's classification of the forest types of India the forests of the Palamau are of following types —

- (I)Type-I — Moist Tropical Forest.
- (ii)Type-II — Dry Tropical Forests.

The most important and also the prime tree species of the Palamau Tiger Reserve is Sal (*Shorea robusta*). Besides Sal the forests have following important tree species in plenty :

Mahua (*Madhuca latifolia*),



Sidha (*Lagerstoemio porvifforo*), Bamboo (*Bcanbuso orundunocio*), Harra (*Terrninolio chebula*), Bahera (*Terminalia bellirica*), Asan (*Terminaho tomentos*), Salai (*Boswellio serrata*), Kamala (*Mallows phillippensis*), Palas (*Butea monosperma*), Bernal (*Bombax ceiba*), Arnia (*Emblicus inlicus*), Kusum (*Schleichera oleosa*), Sardol (*Sterculia villosa*),

Bija Sal (*Pterocarpus marsupium*) and Haldu (*Adina cordifolia*).

Present day challenges :

1. Degraded & depleted grass lands
2. Increased biotic pressure
3. Frequent Fires
4. increased anthropogenic factors
5. Cases of illicit felling, poaching, quarries etc.
6. Naxalite infiltration.
7. Non-cooperation of forest dwellers
8. Over all degradatation of herbivore and tiger habitat
9. Sharp decline in the population of herbivores and tigers.

THE PALAMAU SOLUTION

Regarded as the “spirit of the Indian jungle” the tiger occupies the top of the ecological pyramid with no predators of its own. Tigers are obligate carnivores-solely animal-meat eaters, and their habitats encompass for all practical purposes those of their prey base itself in forests. These super cats also need tranquillity or technically speaking large inviolate expanses for resting, moving, breeding and rearing their cubs. While much of their diet is composed of different ungulate species, they also prey upon ground-dwelling mammals and other opportune prey species.

The suggested technical measures aim to -

- (a) Improve the habitat of the PTR and make core/critical tiger habitat as zone for a healthy breeding population of tiger.
- (b) Manage and enhance forage availability (grasslands) for prey species and their population and thus to facilitate the increase in tiger population.

1. Habitat Improvement

(a) **Protection & preservation of natural forests** - Once the natural forests are protected and preserved nature will take over for its revival leading to the improvement of habitat.

(b) Maintenance of natural grasslands and meadows-

Ideally there should be at least 05 percent area of the tiger reserve should be grasslands. Thus, in the PTR also efforts should be taken to increase the grasslands to achieve the required target.PTR has presently about 1000.00 Ha area of naturalgrasslands. The said grasslands are not in good shape in lack of propercare and maintenance.Winter and summer burning not been carried out as a rule in all grasslands. Thus, none-maintenance of grasslands has accelerated the invasion of weeds like Lantana, Bantulsi, Sida etc.

ACTION: For maintenance of grasslands following operation should be done immediately as per schedule at proper time:

- Weed removal - Seasonal control burning (winter & summer)
- Sowing of seeds of indigenous grass species.
- Use of natural compost/cowdung etc. for the better and healthy growth of grasses.

(c) **Creation of new grasslands:** PTR has a very large area and thus vacant spaces should be identified to develop and create new grasslands in it where seeds of potable grasses like *Cynodondactylon*, *Heteropogan* and *conterus* can be sown. To begin with following grasslands should be developed immediately to facilitate the translocation of herbivores from other places - Betla KRF, Lakuiya, Tenu Bare, Latu and Kujrum

(d)**Water conservation & water availability:** The core area has 205 numbers of water holes. These need to be maintained by – Desilting, Digging, Cleaning and Application of lime and bleaching powder in the water holes.Some of them dry up in the peak summer and thus these should be filled up with water through tankers or



The core area of any tiger reserve is supposed to be a sanctum sanctorum and thus relocation of all the above twenty villages of the core area of the PTR is must and highly recommended to help to have a sustainable population of tigers



by any convenient means. There are 46 numbers of large and small water bodies/check dams in the PTR. Efforts should be taken to make more check dams to tap the rain water of flowing small nallas and streams in the reserve. The three main rivers of the PTR are North Koel, Burha and Auranga. Efforts should be taken to increase the water holding capacity of these rivers.

(e) Forest Fire Management - Fire is a real big problem and its management should be done properly. For better management of forest fires following measures to be taken:

- (a) Fire Tracing
- (b) Maintenance of Fire lines.
- (c) Construction of Fire watch towers at vital points.
- (d) Constitution of firefighting squads.
- (e) Fire control camps during pick fire season.
- (f) Monitoring of fire incidences

(ii) Relocation of Forest villages from the core area: There are 34 villages in the core area. Out of these thirty-four villages - 20 (Twenty) villages are extremely important for relocation elsewhere. They are - Kujrum, Latu, Henar, Ramandag, Khura, Sanayr, Totki, Bhanja, Chapiya, Polpol, Chemo, Kutku, Nawarnago, Tisia, Tanwai, Surkumi, Meral, Khaira, Maromar and Ladi.

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(iii) Vaccination of Domestic cattle in the PTR: Domestic cattle inside any reserve are the big source of different kind of diseases in the wild animals. Mass scale vaccination of domestic cattle inside the PTR should be done on priority basis for the better health of wild animals in the park.

(2) Efforts to increase Prey-Base Population:

The most important prey base species in the PTR are-

- (i) Sambar (*Cervus unicolor*)
- (ii) Chital (*Axis axis*)
- (iii) Indian Bison (*Bos gaurus*)
- (iv) Wild Boar

Among the above herbivores Sambar is the choicest prey species of tigers.

PTR has an alarming and very dangerous situation of prey base. Normally this should be minimum 40-50. The present prey density of the PTR is 4.95 herbivores per sq.km speaks a very sordid and an extremely challenging story. It requires immediate action and attention.

ACTIONS: The following measures are suggested for immediate necessary action: -

(a) Translocation of Herbivores - Translocation of herbivores especially chital and sambhar from selected places and there in situ breeding and then releasing them in the wild is the only means to increase the prey base density of the PTR.

Good number of enclosures of comfortable sizes should be made in the reserve for rearing of translocated herbivores.

In special case healthy Chital, Sambhar etc. from even zoos should be allowed for translocation and keeping in enclosures for breeding purposes. But only their healthy progeny should be released in the wild. In these enclosures insitu breeding of herbivores should be encouraged under the supervision of well-trained veterinarian doctor & his staff.

To begin with at the following six places such enclosures are recommended: Betla KRF (50 Ha), Lukuiya (40 Ha), Teno (40 Ha), Baresand (50 Ha), Latu (50 Ha), Kujrum (40 Ha), Saidup (50 Ha).

It has been found that in Betla compartment 01 & 02 have good number of Chitals but sometimes these chitals move in nearby adjacent villages endangering their lives. Just to save them it is advised have chain-link or any other convenient fencing to prevent the movement of chitals in adjacent villages. It will help to increase their population too.

(b) Establishment of a Rescue Centre: A well equipped rescue centre for wild animals is a must in the PTR. Rescue centre should be well equipped with all the modern facilities, medicines etc. having full-fledged veterinary doctor, compounder, and staff.

Restoration of Tiger Population

Presently as per the scat analysis the PTR has two confirmed tigers. However, this scat collection is only from one third area of the reserve and thus this figure of number two tigers cannot be considered as the total number of tigers in the PTR.

Once the habitat and prey base population are restored with suggested measures hopefully the tiger population will rise itself. The reproductive capacity of tigers are amazing. The pregnancy period is 15-16 weeks and one tigress can deliver even six cubs at a time. However, the mortality rate of cubs is bit high in tigers due to various reasons but if proper care is taken good number of cubs can see the light of the day and grow in adult tigers.

a) Translocation of tigers from other tiger reserves of the country.

For the speedy revival of tiger population in the PTR the translocation of at tigers from the other tiger reserves of the country is recommended. There are tiger reserves like Panna & Pench of Madhya Pradesh where tiger population is in excess and from these reserves tigers can be translocated in the PTR.

To begin with at least five female and three male tigers can be translocated. For the translocation of tigers, detail schemes should be prepared with all technical inputs. Before translocation it should be assured that the habitat of the area is fully improved satisfactorily and is free of biotic pressure along with appreciating prey base.

The following precautions should be taken during translocation of the tigers:

(i) Entire translocation process should be accomplished


under the leadership of well-trained officers & staff and under strict supervision of the experienced veterinary doctor and his team.

(ii) Tigers should be brought by helicopters for quick transportation at proper time preferably having in moderate weather when temperature is neither very hot nor very cold.

(iii) Selected tigers for translocation should be young and from the wild only. No tiger should be brought from any type of captivity.

(iv) Tigers should be brought after full medical checkup under the supervision of experienced veterinary doctor and his team.

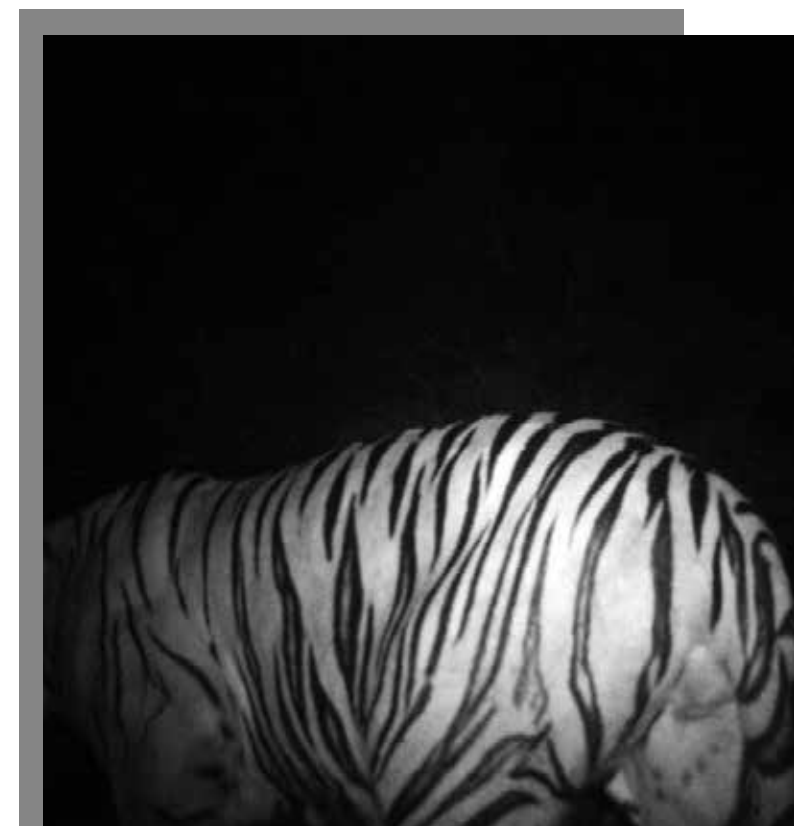
(v) Once the tigers arrive in the park they should be kept in small enclosures and after keeping them for four or more weeks one by one they should be released in big enclosures of 05-06 Sq.km. In this big enclosure Sambar and Cheetal should also be released. This way translocated tigers may acclimatize themselves and may do hunting as they do in the wild.

(vi) Once the satisfactory acclimatization of tigers are felt they should be released in the wild. 

Shri Pradeep Kumar, IFS (Retd.)

Ex PCCF Wildlife & CWLW, Jharkhand.

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PROJECT TIGER

■ *Vemprala V Subrahmanyam*

Project Tiger, which was launched in 1973 by the then Prime Minister Mrs Indira Gandhi, could well be one of the very few ambitious projects of the Government of India which has every reason to celebrate the 50th anniversary in a grand manner. Given the immensely satisfying numbers of tigers in various tiger reserves across the country, the nature lovers have every reason to feel proud that India hosts the largest population of wild tigers in the world.

Though the project was initially launched in nine reserves Jim Corbett, Manas, Ranthambore, Simlipal, Bandipur, Palamau, Sundarbans, Melghat and Kanha National Parks the fact that it has had a cascading and positive impact on all other tiger reserves is something the country can feel proud of. Significantly, the primary objectives of the Project Tiger, according to the official document, were to reduce the factors posing a threat to the very existence of tiger habitats and how to manage them, emphasising the importance of tiger population for varied values including ecological and cultural but, that it took 32 years to form the administrative body National Tiger Conservation Authority (NTCA) in 2005 as the Tiger Task Force recommended, is a different issue. Well, it is always better late than never! The significant outcome of this development was the creation of core and buffer strategy with the core areas having the legal status of a National Park or a Sanctuary and the buffer areas confining to peripheral zones of a combination of forest and non-forest lands.

One of the other biggest objectives is conducting tiger census across the country regularly which also indirectly helps in combating poaching which still continues to be a major threat for the tigers. Creating a national database of individual tigers with photographs to enable in tracing the tigers in case of death, launch of M-Stripes software in 2010 have certainly helped a long way in ensuring that the Project Tiger continues to be one of the most appreciated programmes of the Government of India. Another innovative system to monitor the tigers was the e-Eye system launched in the magnificent Jim Corbett Tiger Reserve using thermal cameras for greater surveillance, aimed specifically at eliminating the human activities



in core areas and at the same time minimising the tiger-human conflicts.

There are some like the 2006 Forest Rights Act which recognises the rights of forest-dwelling communities which could pose serious challenge in minimising the tiger-human conflict, which again has always been a raging debate. What cannot be ignored is the plain fact that these magnificent beasts require vast areas to survive with a huge prey-base. And, the territorial fights amongst the tigers is also a factor which has to be taken into consideration every time a solution is attempted in resolving this critical subject. So, unless this is assured with continuing efforts by the Government agencies and various wings of the society including NGOs and the Gram Panchayats at the grassroots level aimed at reducing the fight for space between

human beings and the tigers.

The more successful the efforts are in seeing the humans not transgressing the limits to venture into the forests it helps in better conservation. One of the biggest threats is the fast-eroding prey base by way of dwindling forests cover, habitat loss forcing the tigers often to stray into the peripheries of the villages and killing the livestock which in turn has the villagers rise up in arms and launch campaigns to give an impression that their very survival is dependent on elimination of the tigers itself.

The most unfortunate development in the issue of tiger-human conflict is the branding of these tigers as 9man-eaters with stunning ease, conveniently brushing aside

the reasons for a tiger resorting to those attacks which no doubt are a cause of concern. It is obvious if one glances through the history of most of the tiger reserves which entertain safaris, one rarely comes across any violent behaviour despite being hemmed in by so many vehicles in any reserve.

For instance a Department staff mauled by a tiger is the worst thing to happen but at the same time it is imperative to find ways and means to eliminate these kinds of tragedies and not merely suggesting that it was the tiger at fault sounds somewhat unacceptable. Definitely, the staff on such duties need to be protected by all means but not at the expense of ignoring the essence of “live and let live” policy be adopted towards the tigers. Somehow, describing any tiger as a 9man eater sounds too harsh without giving equal importance to the factors that lead to the unfortunate tragedies by way of tiger attacks. There is a serious need to keep educating, especially the villagers, the reasons for such attacks and how best they can reduce them by working in tandem with the authorities. And, this has to be a continuous process for sure. Yes, sometimes, there is a huge loss for sure both by way of losing a family member or the prospect of being moved from their villages which are on the periphery of the tiger reserves because that also means they won't earn the livelihood that easily if they shift from their places where they have been living for ages. But, again every problem has a solution and if there are concerted and sincere efforts, even this contentious issue of a tiger-human conflict can be resolved to a great extent. The need of the hour is to ensure a co-existence of tigers



in the forests and the human beings staying far away from the wild as India just cannot afford any more declining numbers of this National animal.

My experiences

For me, nothing fascinates more than seeing a tiger in the reserve. Though many critics insist that any reserve is not only about tigers but also the magnificent flora and fauna that it offers. No questions about that! But it is an indisputable fact that most of the wildlife enthusiasts return with a touch of disappointment when they come back after a safari without seeing a tiger. This is indisputable even as they do end up seeing the other elements of Mother Nature.

For me, my first ever tiger safari was in 2016 when I went to Kolsa Gate in Tadoba in the scorching heat of May, armed with a Nikon D7000 and Tamron 150-500mm f 5.6 mm lens. Being my first-ever safari, there was obvious excitement as we waded through the dry forest then and to our delight in the very first trip saw two cubs on the roadside and the mother inside the bushes (partially seen and not good enough for photograph). The young cubs threw enough hints they meant business virtually indulging in poses, often yawning as if to suggest enough of our pictures!

Then the next five safaris went blank and just when our hopes were fading away, there a dhamaka of sorts as one of the most famed tigresses - Shivanjari, and its four five-month-old cubs were sighted with the temperatures touching 47 degrees. We were so delighted we were that we didnt feel the heat as the joy of seeing the huge tiger and

most importantly the cubs just brushed aside the extreme weather conditions.

The images of the massive Shivanjari crossing the road followed by the cubs individually (not in a group) remain frozen in our memory and the cameras too even now. And the most unforgettable was the never-before sighting of two sub-adult tigers inside the Tipai Mandir in the Tipeswar Wildlife Sanctuary (Maharashtra) which is the closest to Hyderabad a six hour drive.

Those moments of that incredible sighting late in the evening when we were nearing the end of safari were defining moments of my brief, honestly, amateur photography days. As we were meandering through the ghat with the temple located on the right side at the first bend, we saw quite a few vehicles, mostly private, stopped and the visitors looking up.

It took a few minutes for us to realise that there were tigers inside the Tipai Mandir and we would have easily missed them but for the enterprising and enthusiastic group of youth (in a private car) who were the first to spot and in animated gestures suggesting to us about the presence of tigers.

My first impression on seeing one tiger inside the mandir was that it could be one of those huge replicas which are normally seen in any Durga Mata temple! But after gazing at it for a few minutes when there was no movement at all, the tiger turned its head around. That triggered off a wave of excitement and joy as the camera shutter never really stopped for the next 45 minutes as soon one was





🐾 That triggered off a wave of excitement and joy as the camera shutter never really stopped for the next 45 minutes as soon one was joined by the other and the third one was waiting outside. Interestingly, even the mother was there too (deep inside the bushes)

joined by the other and the third one was waiting outside. Interestingly, even the mother was there too (deep inside the bushes).

Well, those were the images which actually prompted me to be a huge fan of the tiger and from then on, the urge to keep visiting the tiger reserves was only on the ascendancy. Apparently, these kind of sightings which sustain the human being's romance with the tiger are possible because of the kind of efforts of the Forest Department, the guides and drivers who are so passionate (there can be a few jarring notes for sure) as they ensure that the tigers thrive in the right environment even as the debate and the threat of tiger-human conflict continues to be burning topic!

Let us not forget their invaluable contribution which continues to ignite the passion of the wildlife lovers. JR





FISHY TALES: A CAT & THE FLAG BEARER OF WETLAND CONSERVATION

■ Text & photo: Krishnendu Mukherjee

They are your friendly neighbours, only if you look at them as one.

Fishing cat, Bengal's state animal, has been sharing space with humans for years in the state's human-dominated landscapes, where conservation efforts to save the Schedule I animal has picked up pace in the last few years but there's still a long way to go.

In spite of being the state animal, scientific works on fishing cats in Bengal are very few. Recently, Kolkata-based NGO NEWS, along with Calcutta University, ZSI and State Biodiversity Board, has done a study to identify their distribution and abundance in wetland habitats of Bengal.

It documented the presence of fishing cats (with camera trapped photographic evidence) from wetlands of

Kolkata, Nadia, North 24 Parganas, Murshidabad as well as a few new locations of Howrah, Hooghly, South 24 parganas and East Midnapore. Eight districts had been surveyed in the last two years and the study came up with 22 locations of the state animal.

The fishing cat is one of the least known felids found in India. The medium-sized felid

characterized by a stocky, powerful build with short legs are widespread throughout their range, their occurrence is reportedly patchy and not well documented (Macdonald & Loveridge 2010). It is among the 15 felid species that inhabit India and like other smaller cat species, it is very poorly understood.

In India, it has been known that fishing cats mainly occur in the mangrove forests of the Sundarbans — which is

home to more than 350 fishing cats, as per a recent survey — and sparsely in wetlands along the Ganga and the Brahmaputra tributaries. They also occur around other well-known wetlands such as the Keoladeo National Park in northwestern India and the Chilika Lake in Odisha.

On the east coast of south India, only a few intact small populations of fishing cats are known to occur, supported by a few recent records and these populations are subject to severe threats

due to habitat loss by aquaculture, persecution and poaching by humans for their meat.

Within India, it is primarily distributed in the eastern parts (Bengal, Assam, Odisha, parts of Andhra Pradesh) and along the foothills of the Himalaya in the Terai tract. One camera trap record had earlier been found in Rajasthan's Ranthambhore Tiger Reserve, too.

But, West Bengal's Howrah district offers a unique case study as the animals here share space on a human-dominated landscape where on an average, 20 fishing cats are found dead every year due to human interventions.

Annual administrative reports prepared by the Department of Forest (Govt of West Bengal) shows during the year 2012-13, 10 fishing cats were rescued, in 2015-16 the number was 11 and in 2016-17 the number was 16.

In 2016-17 natural death of the state animal was recorded to be 6, one by poaching and 2 carcasses were also collected by the forest department. A survey in Bengal recorded 27 deaths of fishing cats between April 2010 and May 2011 only in Howrah district.

In Sundarbans Tiger Reserve, from 2003 to 2009, 11 fishing cats faced natural death and in the same period

20 fishing cats were rescued. In February 2019, an adult fishing cat was rescued by locals and handed over to the forest department.

Fishing cats are killed for consumption and a very recent report from Howrah district, India, reveals the rampant killing of the species outside protected areas, on human-dominated landscapes, for consumption as part of a cultural practice.

In June 2020, a fishing cat in Howrah's Amta block, less than 50 kilometres from Kolkata, was reportedly poisoned to death.

The most reported cause of fishing cat mortality outside protected areas in Bengal during the study period of 14 months was vehicular collisions (8 cases), of which 7 were road accidents and one was rail accident. This was followed by death due to electrocution (2 instances) and ritualistic hunting



Vehicular collision has also emerged as the biggest trigger for fishing cat deaths outside protected areas of Bengal. A recent paper published in an IUCN newsletter analysed data from the Facebook page of The Fishing Cat Project and media reports between January 2019 and February 2020 to identify threats to the animal. The most persistent threat to fishing cats outside protected areas, the study said, was speeding vehicles, followed by deaths due to electrocution and ritualistic hunting.

“The most reported cause of fishing cat mortality outside protected areas in Bengal during the study period of 14 months was vehicular collisions (8 cases), of which 7 were road accidents and one was rail accident. This was followed by death due to electrocution (2 instances) and ritualistic hunting (1 instance),” the study said.

Fear psychosis, as per the study, is the dominant threat where locals kill the fishing cats out of fear.

Researches revealed a declining population facing a series of threats from habitat destruction to active persecution due to perceived conflict.

For conservation and awareness, NGOs are mainly targeting academic intuitions of different districts of the state. According to them, talking about the importance of fishing cat and associated wild fauna with the students

will make a future group of enthusiastic people who will be keen towards wildlife. Taking the students as models will also help spread the awareness in local places they actually belong to.

Under the NEWS-CU-ZSI study, awareness programme has been held in 8 universities, 37 colleges and 5 schools in 18 districts like Bankura, East and West Burdwan, Birbhum, Purulia, Hooghly, Darjeeling, Alipurduar, Jalpaiguri, Cooch Behar, North and South Dinajpur, East Midnapore, West Midnapore, Jhargram, Malda, Howrah, Nadia and South 24 Parganas.

Apart from being the state animal of Bengal, fishing cats play a major role in the ecosystem. Decline of the population of fishing cats can damage the natural ecosystem of the wetland habitat, leading to extinction of the local biodiversity.

“Emerging anthropogenic activities, change in landscapes and destruction of habitats are affecting the population of these cats. It’s important to have community awareness programmes to save the state animal of Bengal,” said Subhajit Maity, a naturalist and member of Howrah Jela Joutho Paribesh Mancha, a platform working on fishing cat conservation in Howrah. ^{PR}

-The author is a journalist by profession IN TIMES OF INDIA and an avid traveller

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KURKUT – A JUNGLE DELICACY

These red ants are social animals. Both queen and male ants have wings. After mating, the queen ant sheds its wings and builds a new nest with worker ants without the help of the male ants. Male ants usually die after mating. A queen ant can lay eggs for many years

■ Dipanjan Ghosh



Red weaver ants (*Oecophylla smaragdina*) are eusocial arboreal ant that aggressively defend their territories against intruders.
Photo: Souvick Mukherjee.

A section of the people living in the jungle areas of the Jangalmahal, in the southwestern parts of West Bengal, earn their livelihood by collecting red ants and their eggs from the forest. These red ants are called 'kurkut' in the local language. They use larval silk to weave together leaves to form their nesting cavities. That is why red ants are commonly called 'weaver ants'.

Red weaver ants or kurkut (*Oecophylla smaragdina*) are aggressive arboreal ants belonging to the family Formicidae in the order Hymenoptera. Their size usually ranges from 8-10 millimetres. Their skin colour is copper-brown and their head and belly are relatively dark black (Figure 1). They have 12-segmented antennae. Mandibles are well developed, each having 10 or more teeth. The palps are short, with 5-segmented maxillary and 4-segmented labial palps. The mesonotum is constricted and narrower than the pronotum and propodeum.

These red ants are social animals. Both queen and male ants have wings. After mating, the queen ant sheds its wings and builds a new nest with worker ants without the help of the male ants. Male ants usually die after mating. A queen ant can lay eggs for many years. Most of the larvae that hatch from the eggs later become worker ants. Small-sized workers and infertile female ants provide the necessary food and other provisions inside the nest. These red ants are omnivorous in their diet. They hunt small insects such as termites and eat various parts of plants, nectars, etc., chiefly for juices. However, they can't eat solid food. Like spiders, they first liquefy solid food by special chemical methods and then eat it.

Weaver ants are one of the most valued types of

• A queen ant can lay eggs for many years. Most of the larvae that hatch from the eggs later become worker ants. Small-sized workers and infertile female ants provide the necessary food and other provisions inside the nest. These red ants are omnivorous in their diet.

insects eaten by humans. This is an all-time favourite tribal delicacy of the hills and jungles throughout India mainly as a protein source since the ants (especially the ant larvae) are rich in high protein, fatty acids, calcium and vitamin C contents. For entomophagy, these ants and their eggs are battered with salt, ginger, green chillies and mustard oil to make a sour, quick and tasty pickle (Figure 2) or 'chokha' and eaten with rice by the tribal people. Weaver ants and their eggs are one of the ways to meet the nutritional needs of the people living near the jungle areas. Truly marginal people who are unable to meet their daily protein requirements, to them this sour-tasting kurkut (red ant chutney) is a priceless nutritional gift of wild nature. At one time, the infamous Amlasol, in the Jhargram district where people had been starving for a long time, came up in the headlines as kurkut became the only means of



Freshly prepared 'Kirkut' is an all-time favourite tribal delicacy
Photo: Dipanjan Ghosh.

survival for the inhabitants.

They live inside a nest that has no specific entry or exit holes. Such nests are usually built in the green leaves of tall and large leafy trees such as Sal (*Shorea robusta*), Mango (*Mangifera indica*), Piasal (*Pterocarpus marsupium*), Arjun (*Terminalia arjuna*), etc., covered with sticky liquid secreted from the salivary glands of their larvae and cobwebs to look like paper-bags. They also stay safe from forest fires by building their nests on tall trees in the forest. Nesting is most common in winter. Their nest (Figure 3) is called 'kurkutpotam' in the local language of Jangalmahal. Weaver ants often build large nests for their own needs. One can find different sizes of ants residing in a single nest. There are thousands of ants in each nest.

These red ants are well known for their aggressive behaviour. Their bite is very painful and a sharp burning sensation is felt after the bite. However, red ants do not have a stinger. They bite very hard and the formic acid in their abdomen causes excruciating burning and pain at the

bite site. Ignoring this terrible bite, the people of the forest have been collecting their nests from morning to afternoon for a long time. During the winter months, i.e., from November to February, people collect kurkut by climbing trees or by using a long bamboo pole with a bag or basket attached with strings to the tip (Figure 4). A hole is poked into the nest with the tip of the pole and it is shaken. In this way, larvae and pupae fall into the bag. The content of the bag is poured into a big plastic container in which some rice and wheat flour is added to prevent the ants from climbing and escaping. A branch is inserted into the container so that adult ants can climb up. Then, the branch is whipped against a tree to release them and the larvae and pupae left in the bag are collected for human consumption.

In addition, kurkut has many medicinal uses. Traditional healers prescribe hot soup of battered kurkut with ginger, garlic, salt and boiled like tea to get rid of accumulated phlegm. Besides kurkut is an infallible medicine for constipation and stomach cleansing. Taking kurkut chutney regularly can protect a person from common ailments like



A kurkut collector is using a long bamboo pole with a bag to the tip
Photo: Avik Dutta.



Each nest of weaver ants is made of leaves stitched together using the silk produced by the ant larvae
Photo: Adarsha Mukherjee.



A vendor is selling ant larvae and eggs in a village haat
Photo: Avik Dutta.

fever, chills, colds and coughs. Its consumption regularly increases the normal immunity and temperature of the body, so people never seem to feel the cold during winter. Moreover, traditional healers believe that regular intake of kurkut will prevent rheumatism. They also prepare oils in which they dip collected weaver ants. After six weeks, oils are used externally to cure rheumatism, gout, ringworm or other skin diseases, or else as an aphrodisiac.

Weaver ants have some other benefits also. Due to their predatory habit red ants are recognized as biological control agents in tropical tree crops as they can protect a variety of crops against many different insect pests. In this way, they are used indirectly as an alternative to

chemical insecticides. In our country, it is a very popular bait for fishing. The larvae of weaver ants are also collected commercially as an expensive feed for insect-eating birds in Indonesia.

Red weaver ants also have significant roles as a means of livelihood for the people of Jangalmahal. The people are accustomed to selling live and readily consumable ants in the market. The eggs of kurkut wrapped in green Sal leaves are sold in various weekly village haats (Figure 5). Also, people are used to storing the sundried ants in containers for selling the same at high prices during the off-season when these ants are not found in the forest. Thus the local people earn money to a great extent.



A view of Coastal City from Worli Fort

OCEAN

■ Dr. Sabyasachi Sautya

Although many people call the vast jungle Amazon as the lungs of the planet Earth, in fact, more than 60% of oxygen comes from the ocean. So, the inclusion of the ocean in Jungle Rhythms is a bit incongruous, but the real jungle is actually the ocean. The ocean is vast and covers over 70% of the Earth's surface, making it the largest ecosystem on our planet. The ocean is home to a vast array of different species, from the smallest microbes to the largest mammals. There are thousands of different species of fish, crustaceans, molluscs, cephalopods, mammals, and more. Despite its impressive size, there is still much that we don't know about the ocean. The deep sea is largely unexplored, and scientists continue to discover new species and ecosystems on a regular basis. The ocean plays a critical role in our planet's climate, economy, and ecology. It produces oxygen, regulates temperature, provides food and livelihoods for millions of people, and is a crucial part of the global water cycle. The ocean is a beautiful and awe-inspiring place, with stunning coral reefs, colourful fish, and breathtaking landscapes. Its beauty has inspired artists, writers, and scientists for centuries. All of these factors make the ocean an endlessly fascinating and surprising place, with countless mysteries still waiting to be uncovered.

So let us learn some of the sea creatures and knowledge about them. By acquiring this knowledge, we make ourselves and others aware of the ocean to conserve more intensely.

Declining Serpents

■ Siddharth Waradkar

Mumbai, formerly known as Bombay, was once a chain of seven islands given as part of a dowry by the Portuguese. It has an enviable 149-km coastline stretching from Colaba in the south to Madh and Marve up north. The coastal areas are mostly occupied by fisherman villages, also known as the Guardian of the Ocean. The Son Kolis are a fishing community of Mumbai and certain contiguous areas. In spite of being in and around Mumbai, which prides itself on being the first city in India, they still retain their traditional culture.

The fishery is dominated by mechanized trawlers, purse seiners, gill netters and dol netters that venture beyond territorial waters in search of fish while small and marginal fishers practicing traditional fishing are deprived of fish in inshore and nearshore waters. While there is an overexploitation in the fishery sector due to loose rules & regulations, but along with this a major element is being ignored. Out of the total fishery catch a small size accounts for animals which have no commercial use or are non-edible. The incidental catch of animals by fishermen which they do not want, cannot sell or are not allowed to keep is collectively known as "Bycatch". This includes cetaceans, sea turtles, juvenile fish, snakes and other small, juvenile wild fishes which cannot be sold in the market. Anything that does not go for auction is often termed as waste or bycatch. The situation is complex and more research is needed to understand the species diversity in these waters.

Sea Snakes are one of the least studied species among bycatch. Interestingly, fishing communities here don't target snakes at all. But declining stocks of commercially



Handling of venomous snakes by locals from nets

valuable fish has meant a higher proportion of bycatch and that includes snakes. The more time you spend at the landing sites the more apparent the complexities of the situation become. We have a long way to go to fully understand the species diversity in these waters. It's important to address the issue of bycatch and find ways to reduce it while also ensuring sustainable fishing practices for both large-scale mechanized boats and small traditional fishers. Waste fishes have been used in other industries like poultry or pig farming for a long time. However, it is only in recent years that these bycatches are extensively being routed to Fish Meal and Fish Oil (FMFO)

Sea snakes are protected under Indian law, but enforcement is difficult in unprotected areas. The Maharashtra Marine Fishing Regulation Act helps regulate fishing practices to reduce sea snake bycatch, but monitoring and enforcement are lacking. While sea




A juvenile snake from the Elapid family

Sea Snakes are one of the least studied species among bycatch. Interestingly, fishing communities here don't target snakes at all. But declining stocks of commercially valuable fish has meant a higher proportion of bycatch and that includes snakes. The more time you spend at the landing sites the more apparent the complexities of the situation become.

turtles and sharks have some protection, sea snakes have been neglected globally. Raising awareness and increasing conservation efforts can help reduce bycatch. Sea snakes are classified into two categories: true sea snakes that live their entire lives in the sea and have an oar-shaped tail, and those that prefer estuaries and mud-flats. India has approximately 26 species of sea snakes, with the hook-nosed sea snake and file snake being the most common along the coast. At fish landing centres in Mumbai, a mix of sea snake species can be found in the bycatch.

They are either killed or left out in the sun to die from loss of moisture, drowning, predation or fear of being bitten. Sometimes more than 100 individuals are found in the bycatch, but while trying to save them the life & death ratio has a big imbalance. Out of 100 only 20 or less than that survive. Most go into shock after being out of water for so long and die when released back into the water. While some are also used as a bait for catching Giant Mud Crab (*Scylla serrata*).

Fishermen along the Indian coast are not interested in sea snakes because they have no economic value and are venomous. However, fishermen are still be exposed to sea snake bites when sorting their catch, even though they do not intentionally target to kill sea snakes. Precautionary measures are necessary because there is no specific antidote for sea snake venom. Developing an antidote is challenging due to a lack of information on sea snake ecology and variations in venom potency among different populations and geographic locations. Awareness programs have been started by the government bodies in various parts of the coast and slowly now fishermen have started to carefully release the snakes back into the waters & even some have started using proper nets for this purpose. There is a big GAP in information and once we start gathering scientific information on them, there is a high possibility of conservation practise on a larger scale!

Ideas are like snake's skin, new one's keep coming up! 



Bycatch along Mumbai Coast



Mix varieties of Sea Snakes as Crab Bait



Sea cucumbers (Holothurians): A vacuum cleaner of the sea

■ Santosh Gaikwad

Sea cucumbers are Echinoderms Sea creatures of class Holothuroidea. They are found on almost every ocean floor. Still, they have the most incredible diversity in shallow water, especially coral reefs. They can be seen from intertidal coastal areas to the surface of deep and dark oceanic trenches. As the name implies, they have a soft and cylindrical body that is more or less elongated, rounded, and occasionally thick at the body end, with no solid components. Its shape is almost serpentine or cucumber-like, sometimes resembling a caterpillar. At first glance, sea cucumbers' bodies do not look like other echinoderms; this is also because they resemble worms, and their skeleton is not apparent. Sea cucumbers are typically 10 to 30 centimetres (3.9 to 12 in) in length. However, the smallest known species are only 3 millimetres (0.12 in) long, and the largest can reach 1 meter (3.28 ft). At the anterior end, the organ consists of a rounded mouth that is usually surrounded by a crown-like structure with numerous tentacles, which can be very complex in some species, while the posterior is the anal end (aboral pole). Like all echinoderms, sea cucumbers have a five-radial symmetry. In most sea cucumbers, five stripe segments are formed along the length of the entire body from the mouth to the anus. Sea cucumbers are typically composed of an internal skeleton of calcium carbonate plates. However, the microscopic ossicles of most sea cucumbers have reduced in size to hide under the skin. Except for one genus, *Sphaerothuria*, the relatively large plate forms have been retained, giving them unbroken protection. Thus, sea cucumbers are unique and beautiful creatures compared to other echinoderms. Today, these animals are threatened worldwide, suffering from human interventions. Sea cucumbers are one of those creatures. Sea cucumbers are now rarely found off the Indian coast (except in a few national marine parks, enclosed areas and Indian islands). Some of the world's and all of India's sea cucumbers are listed among protected animals. It is also scheduled in the Gazette of India, and they are protected from capture. Most of their species were exploited for several decades, making them rare. So, we try to understand these animals to solve this issue and take a step towards their conservation.

Origin and History: The evolutionary origin of sea cucumber species has only recently been somewhat understood. This was due to the lack of extensive fossil discovery and many morphological features of the unified





Sea cucumbers are widely distributed in deep waters, often contributing significant amounts to faunal biomass. At 8.9 km below the surface (compared to 5.5 depth), sea cucumbers contribute 90% of all other marine faunal biomass. Sea cucumbers forage in large flocks. Some sea cucumbers, such as *Eynpniasteseximia* and *Paelopatidesconfundens*, have unique properties that enhance their ability to swim.

related to dendrochirotes and dactylochirotes. Alternatively, these living forms have retained their ancient armour, and holothuroids have had a long and repeated history of losing an armour shape. Belon was the first researcher to describe a holothuroid named *Genitalemarinum* in 1553. He also provided a list of alternative names, and holothurian, a Greek word, is one of them. Rondeletius first illustrated in 1554–1555 and explained two species: holothurians and *Cuccium marinus*. Bohadsch provided the first anatomical description of *Holothuroides* in 1761. Bronn was the first to designate *Holothuroides* as a class, dividing the group into two clades in 1860. The first type was the monotypic flask-shaped *Rhopalodina* (=Rhopalodinidae), and the second included all other holothuroids. Shortly after, Selenka redistributed the species into types with or without breathing tentacles. The search for holothurian characteristics began in 1867. Finally, Kerr and Kim presented the most extended branch suggested by the fossil history of the groups in 2001.

Habitat and bio-geographic distribution: Sea cucumbers are widely distributed in deep waters, often contributing significant amounts to faunal biomass. At 8.9 km below the surface (compared to 5.5 depth), sea cucumbers contribute 90% of all other marine faunal biomass. Sea cucumbers forage in large flocks. Some sea cucumbers, such as *Eynpniasteseximia* and *Paelopatidesconfundens*, have unique properties that enhance their ability to swim. Many more species can swim and spend their entire lives as plankton and drift with ocean currents. Sea cucumbers appear to be the best suited to depth, however they may be found in great diversity at depths of 5,000 metres; numerous species from the family *Elpidiidae* can be found at depths of 9,500 metres; and certain species, such as *Myriotrochusbruuni*, can be found underwater up to 10,687 metres. The CSIR-National Institute of

skeleton. These echinoderms probably continued to evolve into the Lower Silurian, most likely from a little-known group of extinct archaea called ophiocystioids. However, the earliest fossil reports of echinoderms are from the Lower Devonian. Undoubtedly, the oldest bone description is from the Lower Silurian (400 million years ago). The presence of plate ossicles is known from the Ordovician. The plates of holothuroids are identical to other echinoderms, making identification challenging. Nevertheless, these reported plates for holothuroids are well known. Combined with phylogenetic evidence, this suggests that several groups of primitive armour forms existed that are only known to have survived. Armours are

Oceanography discovered the deep-sea holothurians at a depth of 5500 metres in the Central Indian Ocean Basin, where polymetallic nodules predominate. However, sea cucumbers live in dense populations in shallow waters. Strawberry sea cucumbers (*Squamocnusbrevidentis*) live on rocky walls around the South Island of New Zealand, with densities sometimes as high as 93 individuals per square foot. For this reason, one such area in Fiordland is called the Strawberry Fields. *Holothuria* (*Metriatyla*) *scabra* and *H. (Theelothuria) spinifera* live mainly in the sand. *H. scabra* is found from the intertidal zone to a depth of 20 m, and at low tide, they remain buried under the sand. However, *H. spinifera* lives in slightly deeper waters and has never occurred in the intertidal zone. This species has been mainly caught from Palk Bay and the Gulf of Mannar. Their distribution depends on the sand particles' size and organic matter content. *H. scabra* is also a mud dweller; they feed on organic matter in the soil, making it a suitable habitat for sea cucumbers. Sea cucumbers are found in every corner of the world, sea cucumbers are found everywhere from the vast oceans to the gulfs. They are also found in deep to shallow water, from polar to tropical regions. Paulay provided information in 2016 that about 1693 species are present worldwide; however, they are less widespread in the Indian Ocean than in other oceans. Sea cucumbers are found along and off the coast of South Africa, Madagascar,

Kenya, Arabian countries, Pakistan, India, Bangladesh, Myanmar, Indonesia and Western Australia. The southern region of India in the Indian Ocean provides favourable conditions for them.

The Zoological Survey of India (ZSI) strongly recommends that sea cucumbers be placed at the highest level of protection by retaining the list of most endangered species in Schedule Category I of the Wildlife Protection Act of 1972. This detailed study was commissioned by the Central Government to ZSI to assess the status of wild sea cucumbers. He clarified that he strongly feels that this species should remain under the protected category. They realized a considerable decrease in the population of sea cucumbers, so the central government decided to ban the collection of this sea creature in 2002 by amending the Wildlife Protection Act. Approximately 200 species are found in the Indian coral reefs, of which 20 are located in the Gulf of Mannar and Palk Bay areas. A recently published research article by Vijay Kumar and colleagues in 2017 states that 179 holothuroids are present in Indian waters. Two of the 20 are over-consumed, having been exported in large numbers to Asian countries such as Singapore. Sea cucumbers are generally found in the inter-tidal areas of the coast, where sea grasses and coral areas are present. While adults are found in deep water and nymphs are on the shores. Fishing boats near the



coast invariably destroy seagrass beds, destroying sea cucumbers due to the lack of oxygen in the water. 20 sea cucumber species are found in Indian waters, which are of commercial importance. Some of the commercially important sea cucumber species are mentioned below:

1. *H. fuscogilva*; 2. *H. nobilis*; 3. *H. spinifera*; 4. *Thelenotananas*; 5. *Actinopyga miliaris*; 6. *A. mauritiana*; 7. *A. echinites*; 8. *Bohadschia marmorata*; 9. *H. edulis*; 10. *H. atra*; 11. *H. scabra* and 12. *H. impatiens*

Habits: Sea cucumbers feed on tiny particles of algae, small aquatic animals, or excreta of other fauna, which they collect with their 8 to 30-tube tentacles. They help break down these particles into smaller pieces so that bacteria can use them efficiently, thus recycling them back into the ocean environment. Earthworms perform a similar function in the terrestrial environment. Fish and other marine animals prey on sea cucumbers, especially the eggs and young individuals. Some species are cultivated as cash crops, especially in Asian countries. When threatened, some sea cucumbers project sticky threads at their enemies. Some paralyze their own bodies as a defence mechanism. They violently contract their bodies. Sea cucumbers can reproduce either sexually or asexually. Usually, sea cucumbers have male and female reproductive organs in separate individuals. Still, some species have them in the same individual. They are said to be hermaphrodites. Most sea cucumbers reproduce by releasing sperm and egg into the seawater. An organism can produce thousands of gametes, depending on the conditions. In the reproductive system, a single reproductive organ is a significant contributor, which opens on the upper surface near a duct plexus and comprises a set of empty tubules. Fewer than 30 species in the world fertilize their eggs internally and then move their fertilized zygote around with their mouths.

A good example is a species of red-breasted sea cucumber (*Pseudonocellainsolens*). The fertilized zygote enters the body sac of the adult, where it develops and eventually hatches into a juvenile sea cucumber. Some species give birth to their young inside the body cavity, known to give birth through a small slit in the body wall near the anus. In all other species, the egg develops into a free-swimming larva; they hatch after about four days. The first stage of larval development is known as auricularia and is only around 1 millimetre (0.039 in) in length. The larva swims with a long band of cilia wrapped around its body. The larva grows and metamorphoses into Doliolaria with a barrel-shaped body and three to five distinct rings of pupae. Mouth webs are usually the first adult features to appear before regular tube feet. A large population of many sea cucumbers is necessary for this breeding method to be successful.

Importance to ecosystems and humanity

Sea cucumbers are very important to the natural ecosystem and humans.



Ecological functions: The sheer numbers of sea cucumber larvae provide food for other swimming organisms. The number of larvae in a particular area may be so great for some time that the groups of organisms that feed on them quickly obtain nutrition. Many sea cucumbers swallow large amounts of sediment, extracting the organic matter in essence. Large populations of sea cucumbers in an area can take up vast amounts of surface sediments. They can alter the soil's physical and chemical composition, improving sediment quality. During their feeding, they may switch from an oxygen-depleted area to an oxygen-rich site, thus allowing many other organisms to survive the adverse conditions.

Benefit for humans

Some sea cucumbers have excellent food value in some parts of the world. Large-bodied tropical sea cucumbers, known commercially as sea mussels (trepan) or "bêche-de-mer", are dried, used in soups, and eaten in Asian countries. Most industries have survived. Some tropical sea cucumbers release a toxin called holothurin, which is thought to result from intense competition among predators. It is fatal to many small animals. Pacific Islanders catch fish by leaving poison from their body



tissues in the water. Sea cucumbers are not meant to cause harm to humans; In fact, this toxin can slow down the growth of some types of cancer and thus has found importance in medicine. Some isolated compounds are used to prevent the formation of clots in the blood. Because of their usefulness at the global level, many people also cultivate sea cucumbers.


Threats

Overconsumption / Exploitation: Hunting these creatures leads some species to the risk of extinction. Their economic value in the market has become their destructive character. In many places, their eggs are easily obtained for eating sperm. They have been used to conduct research in developmental biology and perform many experiments. Indeed, sea cucumbers have been caught in such large numbers that they have become a rarity. They have completely disappeared from the vicinity of areas associated with fishing.

Ocean acidification: Did you know that our vehicles cause significant problems for sea cucumbers? We need to understand this issue as soon as possible. Pouring too much carbon directly into the ocean from our cars and industrial smoke through air pollution is known to change the chemical condition of the water of the coastal areas. As we know, most sea cucumbers have been recorded in coastal areas. This eventually leads to the destruction of the body tissues of these specialized organisms by acidifying the coastal waters. The acid dissolves the calcium that forms the hard wall of the skin of their body and invites them to come under the grip of diseases. In this way, humans directly affect the oceans' chemistry, putting them in danger.

Habitat loss: In the coastal region, land reclamation is becoming a common phenomenon due to the paucity of space, while on the other hand, in developing countries like India, the population is increasing rapidly. Humans are forcing the land to move towards the sea by cutting

mangrove forests. This is having dire consequences on other sea creatures, including sea cucumbers. They are becoming extinct due to habitat loss.

Tourism: Marine protected areas (MPAs) and national marine parks are home to diverse marine fauna. For this reason, these protected areas attract tourism and other local business to the beach. Diving and snorkelling have adverse effects on these organisms. Activities such as anchorage, diving and snorkelling make these animals trample. This is one way of looking at the damage caused by tourists; there could be many unknown and indirect threats. 

Some Interesting Facts (You Should Know!)

Distracting predators: This is an exceptional kind of strategy. When these animals are threatened by other animals, they detach body parts. This distracts the attention of higher predators. Some sea cucumbers can eject their internal organs under desiccating conditions.

Organ regeneration: Many sea cucumbers can regenerate lost body parts. This is a distinct feature that saves them from extinction.

Without heart and mind!: Sea cucumbers don't have hearts and brains. Water uses the vascular system, which is characteristic only of echinoderms; with the help of this system, they can deliver valuable materials to every part of the body.

Huge size range: They are about 20 cm long, although adults of some of the smaller species may not exceed a centimetre in size, while a large species, *Synaptamagulata*, can reach upto 5 m in length.

Long life span: Sea cucumbers have a longer lifespan than many marine creatures; they can live up to 5-10 years.

THE UNDER WATER COLORFUL LIFE

■ Aditya Salvi



Name a color and you'll find a species, isn't it amazing. Nudibranchs have a diverse variety of colors. And that is one of the beauties of this organism. They are just like underwater butterflies, with vibrant colors. The coloration is due to their survival (avoiding the predator by camouflage), mating (attract a partner to carry out their population) or food intake which gives them color (more chlorophyll intake, the greener they look)

The word Nudibranchs has an amazing background. In Latin nudus is "naked" and in Ancient Greek branchia means gills, altogether it is Nudibranch, the organism which has naked gills. Being classified under the mollusc they are soft bodied organisms. They are commonly called as sea slugs.

The evolution of these mesmerizing life forms will surprise you. They have descended from the shelled ancestors. With time, instead of putting energy for shells and to move faster they lost their shells. The basic function of shells was to protect them. So they developed toxic chemicals. Hence it is suggested that we do not touch these organisms it can be harmful for us.

Throughout the world there are more than 2,000 known species and new records are still identified.

The observations on slugs reported in 1777, as the species *Glaucus atlanticus* floats on the water. And

like a sailor uses natural resources winds and currents to travel the ocean. A genus of nudibranch, *Polycera* recorded from New Zealand by Cuvier in 1817. The reports on collection of nudibranch samples during the Challenger expedition in the year 1875 have been noted. They also reported the biology of the species. And the studies are still going on.

Generally the body consists of the head, mantle and tail.

Head contains a pair of Rhinophores which are the sensory organs. Towards the other end gills which are secondary gills. Instead of gills some species have horn like structure known as certain (Derived from the Greek, it literally means a horn). ^{JK}

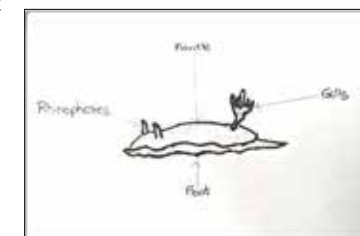


FIG AND FIG WASP

■ Animesh Manna




Did you know? That Fig trees don't have flowers visible from outside. Both the flowers and seeds are inside a casing called a Fig (Pic 1). And to pollinate the flowers inside the specialized casing there are specialized insects as well. Here at Tathastu, Pench we have an opportunity to observe this interesting phenomenon of nature. It attracted our attention when we saw young figs were appearing on the bark of Goolar/ Cluster Fig tree (*Ficus racemosa*) (Pic 2) and lots of microscopic flies flying around them. A close observation revealed those tiny flies were basically wasps or specifically Fig Wasps. These female Beneficial Fig Wasps (Pic 3) were trying to enter the fig through a hole

on the top of the fig, which is called Ostiole (Pic 4). With the few hours of life span, these wasps are quite rushing to enter the core of the fig to deposit the pollen taken from the other fig which they just emerged a few hours ago. While entering they were losing their wings and trying to penetrate as hard as possible (Pic 5) to enter the core but only few of them could manage to successfully enter (Pic 6). The mission is to lay eggs on the galls of the flowers and pay the rent to the mother fig by depositing the pollen on her white flowers she was carrying on her breast. Females die immediately after that. This fig will be the nursery for her eggs and larva to provide food and shelter for the next couple of months (Pic 7). But the story is not

as easy as it appears because the Non-beneficial Fig Wasps (Pic 8), which are parasitic to these wasps, are waiting outside with their specialized ovipositor to drill a hole and lay the eggs on the galls where there are already eggs of Beneficial Fig Wasps. They kill the Beneficial Fig wasp eggs and take over the galls. But there is another layer of drama where there are Parasitic fig wasps (Pic 9) to these parasitic wasps as well. Right after she drills and lays her eggs this parasitic wasp comes and uses the existing hole to lay eggs with her extraordinary ovipositor, which is 10 times the size of their body.

After a couple of months when wasps are ready on the

galls inside they will be waiting for the males (Pic 10) to cut open the galls with their strong mandible and puncture the galls of female wasps and penetrate their long sex organ to deposit the sperm on them.

Females make the hole a bit bigger to release herself from the galls. Then males cut the pollen packed anther from the top of the fig wall which females carefully pack on their breast and wait. The wingless males have the last job to do before they die. They make a hole (Pic 11) on the skin of the fig and release all the females in search of flowering figs, maybe miles away where she has to deposit the pollen and eggs for the survival of both the species. 

Jharkhand Untamed



■ Dr. Anjan Sarkar

It was nine o'clock at night. Winter was just setting in and December was closer. The stars like the tinsels on the canopy of the sky over the jungle of wolf sanctuary around Sarnadih and Mahuadanr were laughing and leaning over one another. The temperature inside the jungle was about 7 degree. A few fire flies were glowing in the darkness... the call of a nightjar was coming off from somewhere after a regular interval. Rakesh was accompanying me with a spotlight and an axe, and I—with my camera and head lamp. We were walking through the darkness of the forest. Cars are not allowed in this forest. There were teak trees in this forest, along with banyan and mango trees... somewhere there were grasslands... it was quite different. Suddenly we noticed a light in the forest. We moved on toward it. After walking about 500 metres we found a tribal couple was sitting beside the fire they had lit with the dry twigs and leaves.

They were Joseph and Mangala—a middle aged couple. After exchanging greetings I asked them why they were in the forest in this cold night. Joseph laughed heartily and replied, "What to do, Sahab, we have cultivated peanuts here. Unless we guard the field wild boar and rabbits will finish all." Again I asked, "When will you return home?" "We won't return", he replied spontaneously. The person who replied, as well as his companion, both had almost no warm clothing with them. There was a scaffold on the tree for resting. A saree was hanged over it to protect from cold. That's all! Later I came to know that they earn their livelihood by selling those peanuts in local market in RS.12/kg. Forest and its people teach us so many things!

My jeep crossed the Aksi check post at breakneck speed and stopped for a moment. On the right hand side there was a yellow board, on it written in black, with an arrow



—Mahuadanr Wolf Sanctuary: This Way... our jeep came down slowly through a slopping laterite road. Milestone showed that Sarandih Forest Rest House was six km from here. Crossing a tribal village the jeep stopped in the FRH campus. The rest house was surrounded by eucalyptus... in the distance, there was Shal forest... dry leaves were dropping down in the wind. A golden oriole was chirping with intervals... Butterflies were fluttering their wings. The flat stones of the quarry seemed to be erected like the flat chest of a tribal youth. In the shadow of a blue sky the Aksi hill was standing beneath the green canopy. Within a second I felt good. Last two days I had ransacked every nook and corner of the forest—6 -7 hours in the daylight and around one and half hours at night. In the mean time almost twice I had lost my way. Indeed I wanted to lose my way. I had visited all the dens of the wolves. After reaching the entrance of the caves where they used to leave I had tried to enter those by crawling, but only two or three steps—one could not

proceed too far. The orifices narrowed down gradually. But the wolves could easily enter through these. However, it was quite specious inside the caves. They could live there easily. I had also captured some snaps of them.


After lunch I was talking to Rakesh as I was resting for some times. I came to know from him about the forest fire. When the forests becomedry in scorching heat, sometimes the friction from dry branches rubbing against each other can ignites a fire. Then it starts to spread through dry leaves and grasses. Sometimes when the villagers used to collect the dry leaves and light those up, the fire spreads in the forest and become bigger. Again, when a deer runs into a dry forest, sometimes the dry leaves catch the fire due to the friction of the hooves. Later it spreads in the forest. I walked through the river bank when the dusk set in and saw the wonderful Aksi in the last ray of the sun. In that golden





eagle was still searching its prey... the jungle had so many messages to convey...

I did not forget to visit the places around while roaming in the forest—the smile of the gulmohars in Sugabandh... waves of water cascading down rocky slopes... the lustre of Lodh waterfalls... the silence of Maromar forest... and the fragrance of lotus in Kamaldah. When I came to

the confluence of Kechki, the sun was setting then. The women and girls of the villages were crossing the river... the river Koyel was in search of another river Auranga. A gaggle of bar-headed geese was floating around. The setting sun too seemed restless. I had also observed the reflection of such restlessness in the eyes of Joseph and Mangala. The forest of Jharkhand was not only wilderness but also restless... in quest for life. 



magic light I found the kingfisher dissolving like a water-colour painting in the canvas of Aksi with the witness of the sun.

The forest officer Ashis babu forbade me to go towards Chatra district. The Naxalites had started again to set up their base in the other side of the Aksi hill. That area was a little disturbed. I do not know, when the inequalities between the 'haves and have nots' will be abolished! It causes so many scuffles in this world. Will it ever be possible? We, ourselves have cherished it.

It seemed to me that poaching was going on in the forests of Betla—Palamou, even if not in Aksi. Perhaps the forest department knew it, but did not want to reveal it. Even when I came here few years ago, there were a large number of spotted deer in this forest. But this time, it seemed much less. I like the dawn of Betla—Palamou

very much. The banter of the little monkeys, the bustle of the wagtails, the lazy walks of the deers, the call of the Indian Nightingales... spontaneously the mind becomes refreshed. In the way to safarian Indian roller flew in front of my jeep spreading its turquoise blue wings in the canvas of the jungle and dissolved like a painting. The peacock disappeared in the golden light of the forest with the peahen. One dusky owl turned its neck towards me. The spotted deer stretched its body just like a skilled gymnast. A quick jump like to be 10/10 score... as if a white spotted golden yellow veil just appeared and moved away. A collage of so many frames! In the late afternoon the yellowish orange sun was weaving a magic moment in Betla. There was a grey hornbill behind the Mahua leaves. A herd of elephants was throwing sand with their trunks on their backs. A Great Indian hornbill was watching the sky holding its head high... the yellow eyes of the serpent



TIGER AND ME




As I believe that tiger is very gentle predator and always keep distance from humans. If we do not restrict ourselves and venture too close, tiger naturally will attack.



After the tigers put some distance from me I was ready to move when I heard another motorcycle coming in my direction and guessed that it must have been Mr. Mishra, the Range Forest Officer, Sonaripur Range and in-charge of the RRA. He arrived and saw me waiting on the road. When he asked me the reason, I quietly pointed my finger towards the footprints of tigers on the dusty road and asked him to look towards his left. He saw three tigers together on a single spot. We watched the tigers for a while a rare moment usually shared around a campfire.

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One more such incident when I had to leave my motorbike in nearby village and walk down to Salukapur by covering roughly 3 Kms. It was moonlight as me and my field assistant reached the buffer forest area when a big male tiger was sitting on the main pathway and watching us. In the meantime, a cobra snake crossed the pathway. Tiger seems to be uneasy at the start and moving in opposite direction. Me and my field assistant Kalicharan (a daredevil person) moved forward and safely reached Salukapur - our station. This is the tiger that we used to track then in Rhino area and I have never seen any unacceptable behavior -always gave a gentlemen's response. 

■ Dr. SP Sinha

Commonly known as the sugarcane tiger during late 80s, it is believed that tigers of Dudhwa Tiger Reserve are very erratic and less tolerant with always amood to attack.

During my field days, in such morning, I was recording observations on swamp deer in Banke Taal waterbody from the wooden Machan. It was winter and I had reached the area around 7 AM to observe the swamp deer, to record the total count by gender and age classes and their behavior. For the next two hours I continued the observations and took several photographs as part of the documentation. After completing the work, I was ready to return to Salukapur. I packed up my spotting scope, camera, and other field equipment and I hardly might have covered about 20m from the watchtower on my



bike when suddenly, two sub-adult tiger cubs appeared in front of my motorbike, just 10-15 feet away. I stopped in my tracks. The cubs were staring at me, obviously with curiosity. It is dangerous to be confronted by cubs because the mother would always be close by. A tigress with two cubs at close quarters is invitation to very serious trouble. Soon what I had anticipated happened. I sensed a movement towards my left and my heart missed a beat - the big mother emerged from cover and standing at the edge of the tall grasses made a purring calling her cubs. Both cubs immediately left the road and ran towards their mother. I silently waited with great trepidation watching them which is the best I could have done under the circumstances since any sudden movement on my part could have precipitated an attack from the mother in defense of her cubs.



Sighting of First rhino calf born in Rhino area in Dudhwa NP



DR SP Sinha

On 2 March 1989, as usual we proceeded on elephant back for the early morning monitoring work within the RRA. Just as we had covered a few hundred meters inside the entry gate of Salukapur, a lone female rhino named Himarani came in front of us. Suddenly, I noticed a small creature moving behind her. The visibility was much better in March since the grassland had been burned in patches—the patch burning took place automatically since the fire stopped where the grasses were still wet. This mosaic was an ideal habitat for all the grassland dwelling wildlife. In the absence of prescribed burning in the past, natural fires or those set by the wayfarers including poachers when no one was looking had worked similarly. The dacoits did not indulge in such activities since maintaining secrecy was in their interest!

As we sighted the small animal behind the rhino I asked the mahout to proceed a little closer. As we approached the female we were in for a surprise of our life - a moment that I cannot ever forget. We were looking at a baby calf still in

its pinkish coat, standing close behind its mother and suckling. The news was conveyed to the DNP Director on wireless and also to Prof Sawarkar. Within an hour of sighting of the calf the Salukapur camp was abuzz with the news and by the arrival of forest staff. Except for the forest staff and those involved with rhino monitoring no one else was admitted near the RRA, let alone inside. Mr. RP. Singh was the Director of DNP. He was an astute forest officer, keen about the wellbeing of the rhinos and the work related to monitoring and management of the rhino habitat. He used to spend hours on the elephant back in the RRA. His instructions to the staff were always precise. He was naturally very happy on getting the news.

Now for us the challenge was to protect the calf from predators. Following a brain wave I suggested that it would wise to restrict this female with her calf to a small area within a secure power fenced enclosure that could also ensure intensive monitoring. Finally an area of

3 km² was thus fenced. The enclosed area had all the habitat requirement right from water body, patches of short and tall grassland, few scattered trees and a wallow. On both sides of the enclosure two groups of people were deployed in temporary camps and riding elephants were engaged for the purpose of deterring any tigers or other predators if they came close to the fence or were sighted inside the outer fenced area of RRA. One day I found that the calf had some injury on the pinna of its right ear which was bleeding. I immediately informed the officer-in-charge and Director, Dudhwa NP. The problem was that DNP did not have a regular veterinarian to look after sick animals, therefore the vet from the Lucknow zoo was contacted but as he was not present at the headquarters, I decided to treat the calf myself. I made a mixture of savlon, turmeric powder, and little amount of phenyl and turpentine oil. With the help of an improvised pump, the concoction was sprayed on

the calf and her mother. The purpose was to keep off the flies and insects. In the beginning, they resisted approach and the treatment but later on they allowed the operation. The remedy was quite effective as it kept away the insects from the site of the wound and acted as a disinfectant. We continued with the exercise for 3 days and the wound began to heal nicely. The strategy of sequestering the mother rhino and calf worked out well and finally after six months the female along with her grown up calf were released into the main enclosure, the RRA.

When I visited Dudhwa in 2005, the calf, a female was sixteen years old. She was also the mother of two calves.

In 1991, I went for a short stay at WII, Dehradun. There I came to know that an International Rhinoceros Conference was going to be held in San Diego, USA. So I wrote a paper on my experience in monitoring the reintroduced rhinos and sent it for the consideration of the organizers. The paper was accepted but they informed me that as they had limited funds and therefore they were unable to provide me any financial assistance for the purpose of participation in the conference. I was disappointed and went back to continue my work in Dudhwa but somehow had a feeling that something good was going to happen regarding my participation in the conference. Only a few days later, Mr. R.P. Singh called me and informed me of an impending visit to DNP of His Excellency, Mr. William Clark, Jr. Ambassador of the United States to India. He was coming to Dudhwa to see the rhino reintroduction work. Mr. Singh insisted that I must accompany him and his wife on this visit. Next morning Mr. William Clark and his wife arrived and after initial introductions were provided the two riding elephants that were familiar with the area. Few local police personnel were also there and they wanted to accompany the ambassador but they were not allowed. Mr. Singh assured them that the security of the ambassador and his wife was the responsibility of the forest staff. The ambassador had left behind his marine escort at Billy Arjan Singh's farmhouse—Tiger Haven where they were staying. They were jubilant to observe the reintroduced rhinos in their new habitat. As both of

them were very happy with my work, they invited me to dinner. Luckily, I had a photograph of a hispid hare which I had discovered in DNP. This was the first time that anyone had photographed a hispid hare in Dudhwa national park. I presented the photograph to the ambassador along with another of Himarani and her calf. Later, during that evening I mentioned the International Rhinoceros Conference in San Diego, USA and that my paper had been accepted and that it would be presented in my absence at the venue. The ambassador informed me that he was from San Diego and that he would try his best to get funds for my participation in the conference. Several weeks passed





and I began losing hope since other funding agencies also had stated their inability to fund my participation. Suddenly, one day I received an official letter from the US Embassy giving me the wonderful news that my trip to the conference would be fully funded and that I may prepare for the travel and my participation at the conference. I also received a letter of appreciation from His Excellency Mr. William Clark, Jr with some encouraging comments about my work. He had also mentioned the photographs that I had gifted to him adorned the wall of his chamber by his desk. Some years later he visited the Wildlife Institute of India, Dehradun. Fortunately I happened to be there on the occasion. It was our last meeting but we subsequently continued correspondence. I will always be grateful to him for his kindness and generosity. He went back to the United States after completion of his tenure but left behind memorable moments that we had once shared in the Dudhwa National Park. I believe that there are more good people in this world than the bad ones and they render help to those who are in need at a time when their help is needed.

Billy Arjan Singh a naturalist and conservationist in his own right was a neighbor of DNP. He had his farm and a

guest house known as Tiger Haven that I have mentioned earlier. On many occasions, I had watched his short feature films and read his book on tigers and the Tiger Haven. In the film he had an imposing presence with his muscular body accompanied by the tigress Tara that was presented to him as a cub by the Twycross Zoo that he had raised to adulthood and two leopards and his dog riding a boat. I had not had an opportunity of meeting him during my first two years at DNP. Later one evening, while I was returning to my camp from Palia town, the closest a jeep overtook my bike and stopped suddenly. I was surprised by this rash act and waited for the occupants to alight. I saw a stocky, broad shouldered person walking towards me. He gripped my hand in a firm handshake. This is how for the first time I had met the legendary Mr. Arjan Singh. A handshake tells everything about a person and his firm handshake revealed the man he was. It was obvious to me that he had known about my presence in DNP and of the work that had been assigned to me. He seemed a little upset that having been working in DNP I had made no attempt at meeting him. I stated that since I had no work with him, I thought it unnecessary to disturb him. He seemed to have accepted my explanation.

One day Arjan Singh ji appeared at my camp at Salukapur and told me that he wanted to watch wild elephants that had entered the park. There were itinerant herds of wild elephants that from time to time entered the park. A male or two used to stay much longer after the herds used to depart after several months. I offered to accompany him to the wooden watch tower built on a Sal tree close to the Salukapur FRH on the damara. From the top of that tower, one could see a vast expanse of the grasslands below including the areas along the stretch of Suheli River that was a popular haunt of the rhinos. One Swiss couple who had spent a few days and nights on this tower were able to sight most of the species. On the watch tower or any other place that affords sighting animals one needs to have patience and maintain silence. Keeping the eyes peeled and ears open to the sounds of the forest is important. Wild animals have no interest in human beings but an animal may see any movement and then choose to remain out of sight. As Arjan Singh Ji and I were watching from the tower, four tuskers appeared from our left. They were slowly moving towards the fence. Arjan Singh Ji was elated when he saw those males together. Then I suddenly remembered that my field assistant had just left Salukapur camp for his village. He was

to proceed on his bicycle in the same direction in which the elephants were approaching. We tried our best to alert him by shouting but he could not hear us. Immediately I climbed down from the watchtower and moved posthaste on my motorcycle toward the likely location of my field assistant. Mr. Arjan Singh also followed in his jeep. Soon I saw my assistant, I stopped him and asked him to throw his bicycle inside the rhino fence and sit on my motorcycle pronto. In the meantime the four elephants were walking towards us. Without losing time I drove the bike in the direction from where I had come. Next moment my assistant riding pillion warned me that one young tusker had started giving us a chase. However we were moving much faster and the elephant gave up his charge shortly—probably a mock charge to scare us away. Mr. Arjan Singh driving his jeep, his driver and one more person had seen what was happening and anticipating my reaction had reversed his jeep. Finally all of us returned to Salukapur. Mr. Arjan Singh had heard reports about me that I did a lot of my work my work on foot. He warned me that I should refrain from taking such risks as my imprudence could cost me dearly for the grass cover was tall and thick and the Dudhwa tigers were unpredictable and dangerous. He advised me to take adequate precautions. ^{JR}



Project Tiger & Project Elephant Merger

■ Diptarka Ghosh

[The Tiger dies without the forest; similarly, the forest is cut down without the Tiger. There can be no forest without Tigers, and no Tigers without a forest. The forest shelters the Tigers, and Tigers guard the forest.] - The Mahabharata Udyoga Parva: 5.29.48

“nirvano vadyate vyaghro nirvyagham,
chidyate vanam; tasmadvyaghro vanam
raksedvanam vyagham ca palayet.”



Tigers are considered the most popular charismatic megafauna among all Big Cats. As the Apex Predators in an ecosystem, Tigers are a “Beacon of Biodiversity,” helping maintain the region’s ecological viability, water, habitats, and climate security. Therefore, the presence of a Tiger reflects the health of the landscapes they inhabit and indicates the integrity of the entire ecosystem. Tigers have played integral roles in ancient folklore and modern cultures, being used to represent various characteristics and symbolism throughout centuries.

What Led To Project Tiger – India’s Best-Known Wildlife Conservation Program

From abundance and a position of reverence to a brush with extinction – this sums up the story of Tigers in India. Tigers were widely extant in India and not threatened until the first decades of the 20th century. However, indiscriminate hunting and habitat loss reduced their population from 40,000 to less than 1,800 in about a century. Many eminent naturalists, including E.P. Gee and Jim Corbett, raised alarms over the steep decline of tiger numbers in India during the early 1960s. In July 1969, the Indian Board of Wildlife recommended a complete ban on all wild cat skins. The 10th Assembly of IUCN in New Delhi also listed the Tiger as an Endangered Species in the Red Data Book.

“To the people of Kumaon and Garhwal, Corbett was their savior, who delivered the village folk from the jaws of marauding man-eaters. To the world, he presented the Indian tiger in a new light – a world heritage that had no substitute. He was the first man of his time to call for the tiger’s protection.” - Jim Corbett: Hunter-Conservationist by Reeta Dutta Gupta.

The then Honourable Prime Minister, Smt. Indira Gandhi spearheaded a fight against the growing tiger crisis by immediately deputing a team of specialists to study the latest status of the species and “plan how best to save the Indian Tiger from extinction.” The Executive Committee of the Indian Board of Wildlife also constituted an 11-member Task Force. The seed for “Project Tiger” was thus laid. In its final report submitted in August 1972, the Task Force recommended 8 Tiger forests spread across



India to be brought under the purview of the Project. On April 1, 1973, Project Tiger was formally launched at the Corbett National Park with a total of 9 “Tiger Reserves.”

What really established the future foundation for the Tiger’s survival was Mrs. Gandhi’s very first public message for Project Tiger. She said: “The Project is a comment on our long neglect of our environment as well as our new-found, but most welcome concern for saving one of nature’s most magnificent endowments for posterity. But the tiger cannot be preserved in isolation. It is at the apex of a large and complex biotope. Its habitat, threatened by human intrusion, commercial forestry, and cattle grazing, must first be made inviolate. Forestry practices, designed



There is little information so far on the division of funds. Would the funds be allocated based on the number of animals? What would happen in areas like the Sundarbans, where there are no elephants? Would the fund be further reduced? It all remains to be seen

to squeeze the last rupee out of our jungles, must be radically reoriented, at least within our national parks and sanctuaries and pre-eminently in our Tiger reserves. The narrow outlook of the accountant must give way to a wider vision of recreational, educational, and ecological value. Is it beyond our political will and administrative ingenuity to set aside about one or two percent of our forests in our pristine glory for this purpose?”

Project Tiger - one of the world’s largest species conservation initiatives is an ongoing Centrally Sponsored Scheme of the Ministry of Environment, Forests & Climate Change, Government of India, which provides central financial assistance to the tiger states for tiger conservation. In

2006, the learnings from Project Tiger led to the creation of the National Tiger Conservation Authority (NTCA), which basically provides statutory backing to the tiger conservation agenda in India. The exclusive concentration on tigers is believed to be one of the main factors in Project Tiger’s success. Technically skilled officials were assigned to Project Tiger, and they, together with the organization’s goal of tiger conservation, were crucial to the increase in tiger population.

At present, tigers occupy around 89,000 sq. km in India, while forest areas within tigers’ range is about 381,000 sq. km. Under the stewardship of Project Tiger, the initial number of 9 Tiger Reserves (18,278 sq. km) in 1973 has currently expanded to 53 Tiger Reserves, cumulatively protecting an area of 75,796.83 sq. km, which is about 2.3% of the country’s total geographical area. An analysis released by the Wildlife Institute of India has put the average number of tigers in India at 3,682. The country harbors approximately 70% of the global population of adult free-ranging tigers and over 60% of the global genetic variation in the species.

Project Elephant

“Everything is not yet lost, the last hope of freedom has not yet vanished completely from this Earth, and, who knows, if we stop destroying elephants and save them from

extinction, we may yet succeed in protecting our own species from our destructive enterprises as well.” - Roman Gary.

The Asian Elephant (*Elephas maximus*) is found in parts of Northern, Eastern, and Southern India, as well as the central and southern Western Ghats. In 1992, the Government of India introduced “Project Elephant” as a centrally sponsored scheme to safeguard elephants, their habitats, and migration routes; address the problems of elephant-human conflict; and ensure the welfare of elephants in captivity.

The recently released Elephant Corridors Report 2023 has revealed that 150 elephant corridors have been identified in 33 Project Elephant reserves and elephant habitats. The 33 elephant reserves cover 80,777 sq. km of area across the country. Assam and Tamil Nadu have the maximum elephant reserves, while West Bengal has the country’s highest number (26) of identified elephant corridors.

Merging Of Project Tiger With Project Elephant

Like tigers, India is a significant stronghold for the Asian elephants. Elephant habitats are all within the tiger’s range; therefore, the investments made for the Tiger have also benefited the Elephants. Problems that plague Tigers also affect Elephants, like fragmentation of habitats and corridors, demand for body parts for illegal wildlife trade,





and conflict with humans. Therefore, based on a pilot study, the Project Elephant Division of the Ministry of Environment, Forest, and Climate Change (MoEF&CC) and the NTCA have decided to merge the nationwide elephant estimation with tiger monitoring in 2022.

In April 2023, the MoEF&CC announced the merger of the two major flagship species conservation programs: Project Tiger and Project Elephant, for mutually benefitting purposes. An official order dated June 23, 2023, confirmed the merging of these two centrally sponsored schemes and the creation of a new division: "Project Tiger and Elephant Division (PT&E)." The staff and divisional heads of Project Elephant (PE) will report to the Additional Director General of Forests (ADGF), Project Tiger (PT), who has now been designated as ADGF (PT&E), and is also the Member Secretary of the NTCA.

A similar proposal was made in 2011 by the erstwhile Planning Commission to merge the three Centrally Sponsored Schemes: Project Tiger, Project Elephant, and Integrated Development of Wildlife Habitats program – into one. However, the plan was dropped by the then

Minister of MoEF&CC, Smt. Jayanthi Natarajan, after the members of the National Board for Wildlife, described the merger as "a very retrograde step." This time, several wildlife experts and activists are also demanding a similar rollback of the merger.

Concerns Regarding The Merger

According to DownToEarth, the actual fund allocation for tiger conservation has been dwindling since 2018-2019, and the amalgamated budget of Project Tiger and Project Elephant in 2023-2024 is much lower than the previous year's combined budget. The combined funding for Project Tiger and Project Elephant initiatives in 2023-2024 is Rs 331 crore. This represents a decrease from the total budgetary allocation of Rs 335 crore, which includes Rs 300 crore for Project Tiger and Rs 35 crore for Project Elephant. When the budgets for Project Tiger and Project Elephant were combined, the actual fund released in 2022-2023 was only Rs 220 crore, or around two-thirds of the total amount. While the merger aims to rationalize funding and improve conservation by reducing overlap in areas with both projects, the lack of funds and the

confusion regarding the division of funds have raised concerns among wildlife experts.

According to Dr. Amita Kanaujia, Director of the Institute of Wildlife Sciences at the University of Lucknow, "Each animal must receive individualized care to solve its problems. The combination of Project Tiger and Project Elephant has degraded the two initiatives." Dr. Kanaujia further explained that the tigers live in a 'core area' that requires a sufficient number of smaller animals as prey; whereas, for elephants, it is essential to have safe corridors for their movement and ensure the availability of grass and vegetation so that they do not move into human settlements. As such, the two animals should have individual programs. Biswajit Roy Chowdhury, a wildlife expert and a member of the West Bengal State Wildlife Advisory Committee, also expressed similar concerns. "There is little information so far on the division of funds. Would the funds be allocated based on the number of animals? What would happen in areas like the Sundarbans, where there are no elephants? Would the fund be further reduced? It all remains to be seen," he said.

Keeping The Hope Alive!

A statement by Mr. C. P. Goyal, IFS, Director General

of Forests and Special Secretary, has clarified that "both the projects which have shown great success are running independently since they have distinct objectives and approaches towards species conservation. The merger is of not the projects but the centrally sponsored schemes Project Tiger and Project Elephant so that a consolidated one Annual Plan of Operation of all the Tiger Reserves and Elephant Reserves from states is submitted. It will bring great synergy in taking protection and habitat management works in the field and will also optimize the resources."

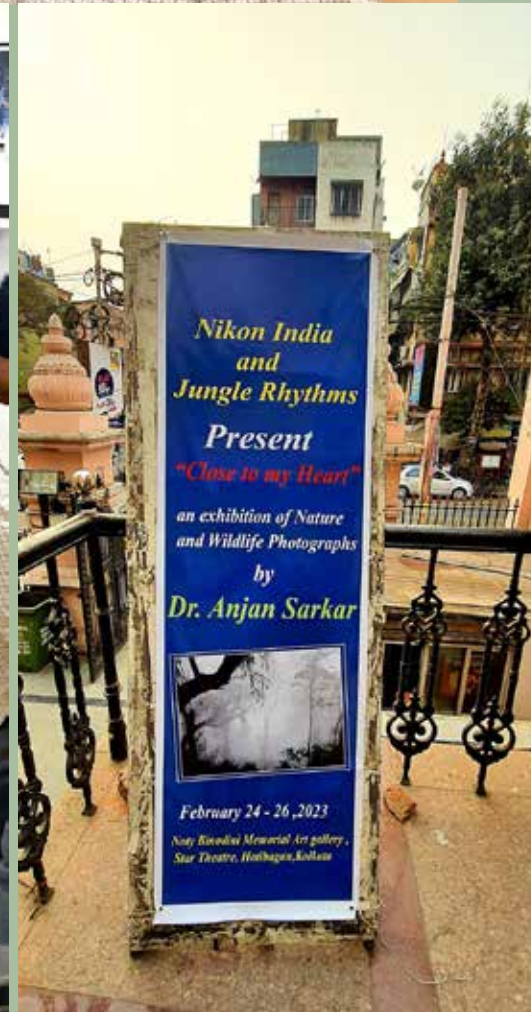
Dr. Pradeep Vyas, a retired Forest Officer from West Bengal, expressed hope that this decision to merge the two projects would not affect the conservation process. He said, "I think it is an administrative decision. National Tiger Conservation Authority (NTCA) has been looking after leopards and rhinos for a long time in some areas; hence, adding elephants should not be a problem if handled well."

The Government of India firmly believes in "One Earth, One Family, One Future" – i.e., the interconnectedness of all living beings and their dependence on each other for survival. It is, therefore, the duty of every citizen to uphold this belief and ensure that the conservation efforts for these two majestic species do not go in vain.



“CLOSE TO MY HEART”

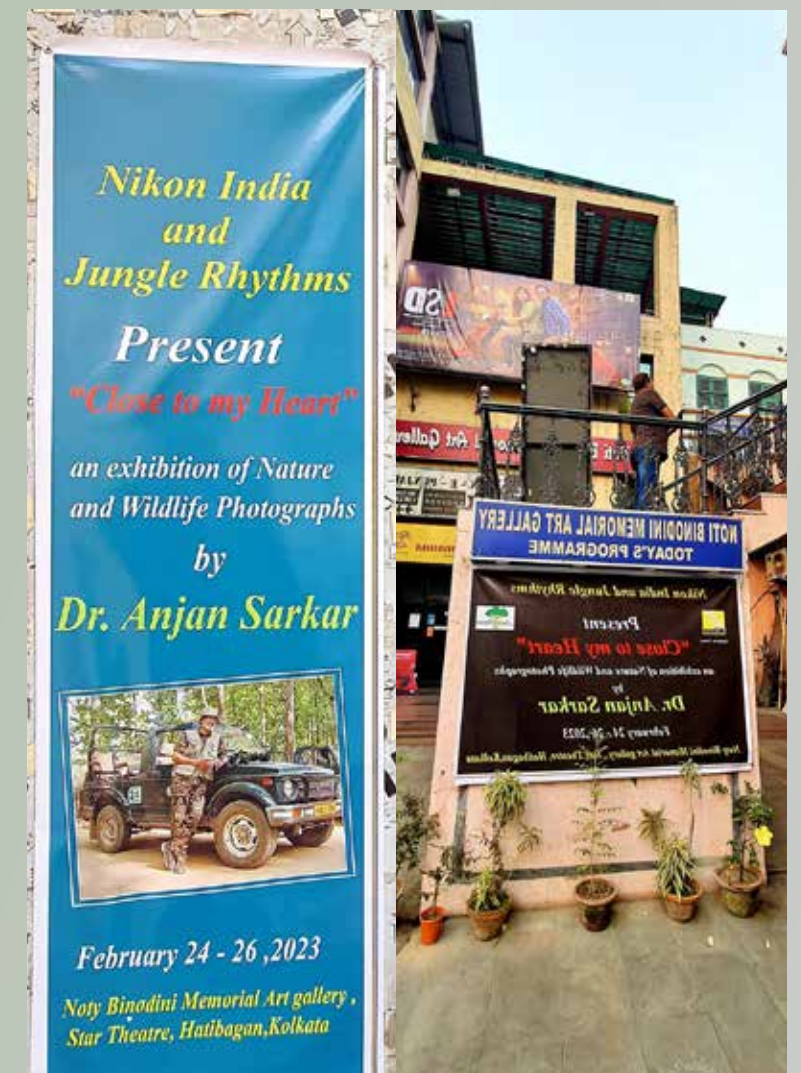
Jungle Rhythim photography Exhibition



Jungle Rhythms and Nikon India organized the 3rd solo exhibition of Nature and Wildlife Photographs by Dr. Anjan Sarkar at Noty Binodini Memorial Art Gallery of Star Theatre, Kolkata from February 24th to 26th 2023 in memorable presence of Sri Adinath Das (Cinematographer), Sri V.K.Yadav (Former PCCF Wildlife and CWLW Forest, West Bengal), Dr. Nirmalya Chakraborty (Founder and Editor Jungle Rhythms), and Sri Shibashis Mukherjee (Dy. Manager Nikon India).

The electronic media who covered this exhibition and took interview are – Sangbad Pratidin and Sangbad Darpan respectively.

Dr. Anjan loves nature and wildlife photography because of his love for the tranquil beauty of nature. His art of photography exemplifies his passionate involvement in the art of framing nature in the wild. His work reflects that nature has a similar pulsation of life, as human beings have. Anjan's works tempt viewers for witnessing some of the most breathtaking moments. His works, accolades are proof of dedication, immense perseverance, patience and isolation to get closer to mother Nature. Moments he presented prove that he is a man of science blended with an insight of an artist amalgamates perfectly to save his pictures as a specimen of realistic artistry. **JR**





Jungle Rhythms Global Tiger Day Celebrations 2023

Jungle Rhythms invited all the kids to roar the loudest and spread the message of love for nature and conservation of the tiger and its habitat on the eve of Global Tiger Day on 29th July (Saturday) by participating in:

The Events:

1. Wild Art Competition (Age 10 to 15years)
2. Essay Writing Competition (Age 10 to 15years)

Essay Competition Topics: "A Day from the life of a Tiger" or "Tiger and India"

Art Competition Topic: "Save the Tiger"

Awards were presented to the kids who could express their feelings in art or writing in the event.

Jungle Rhythms Global Tiger Day 2023 Celebrations were fully dedicated to nurture our future minds to think green. St Francis High School has been working closely with Jungle Rhythms to have a focused agenda to continue their green obligation as part of their curriculum and education. They are our esteemed Green School 2022.

Jungle Rhythms also planted saplings along with the teachers community as part of the Vanamahotsava 2023 - our green cover initiatives. The plants are all taken special care by the students club.







Jungle Rhythms Lifetime Achievement Green Teacher Award 2023

Jungle Rhythms is privileged to award the prestigious Lifetime Achievement Green Teacher Award 2023 to honourable and respected Dr. (Sri) Supriya Kumar Sadhu.

Dr. Supriya Sadhu has been instrumental in spreading awareness on environmental protection and restoration. He has travelled many districts, towns, and rural Bengal in his "Green Bicycle" to spread the key messages of aneco-sensitive lifestyle and enrich local biodiversity in simple practical ways. His leadership and mentoring skills as a principal have helped - renowned Bolpur High School to have a permanent Green Agenda by involving students to execute projects that can give results.

Dr. Supriya Sadhu is now retired from Bolpur High School but is now actively working with National Children's Science Congress to help shape our green minds and future.

Jungle Rhythms wishes Dr. Supriya Kumar Sadhu a very long journey of success happiness and a great life.

ABOUT Dr. SUPRIYA KUMAR SADHU

Dr. Supriya Kumar Sadhu, M.A. (Education) M.Sc (Botany), B.Ed, Ph.D joined Bolpur High School as an Assistant Teacher (AT) in Life Science. Previously he served in Barala Ram Das Sen High School, Dt. Murshidabad, WB, in the capacity of AT in Botany from 01.07.1987 to 27.08.1997. He successfully fulfilled the additional responsibilities of Teacher in Charge (TIC) of Bolpur High School from 24.11.2008 to 17.07.2014 and then he was appointed as the Headmaster of Bolpur High School on 18.07.2014. He superannuated from his service on 30.09.2023. Presently he is serving as the Principal of Ekalavya Model Residential School, Bolpur. Dr.Sadhu performed several administrative responsibilities in addition to his normal duties. He is the District Academic Coordinator of NCSC, a DST, Govt. of India sponsored program since 2010.

Dr. Sadhu took many initiatives since the beginning of his tenure as the Head of the Institute of Bolpur High School. The school has a playground within the campus but no grass developed there since the beginning for the soil texture. Dr. Sadhu took initiative, raised fund and with that the surface layer of sandy soil is removed and fertile soil is deposited. After that seeds of grass were laid to transform the campus greener.

The soil of Birbhum district is semi-arid. Average rainfall is low here and in summer, water level goes down which causes difficulties for common people. By realizing this problem Dr.Sadhu took a project of recharging the ground water resource by sending rainwater collected from the roof of Bolpur High School building to underground through soak pit. The rain water from 12000 sq.ft. roof top area is collected and percolated into soil through these low cost 8 numbers of soak pits. This became a model plan of rain water harvesting and ground water recharge system.

Dr.Sadhu is a member of Birbhum District Biodiversity Management Committee. He works for conservation of nature and biodiversity. In Bolpur High School and adjacent area he planted many native plants of this district. He also took a great initiative for conservation of birds in these trees, soil made bird nests (more than 50 numbers) are installed in the branches of these trees. Birds feel comfortable to stay there and lay eggs in these nests. Like other urban areas, there is scarcity of large trees in Bolpur town also. Hence there is scarcity of safe places of birds also but the steps taken by Dr.Sadhu, the Bolpur High School campus is now a safe zone for the birds also. The necessity of conservation of nature is regularly explained to the students and the students look after these birds viz. Bulbuli, Tuntuni, Chhatore, Pigeon, Salikh, Ghughu, sparrow, moina etc, and they keep them safe here. On World Environment Day every year Bolpur High School plants several numbers of trees, though this year it was different because of COVID19 pandemic. The students and teachers this year planted trees in their own house and the video of their tree plantation is uploaded in Bolpur High School Youtube channel, to spread awareness and boost the idea of tree plantation.

Under the able leadership of Dr. Sadhu Bolpur High School started a new venture for the protection of environment,





This is a pioneer project in this district. The Divisional Forest officer, Birbhum also praised this innovative idea and assured their assistance for smooth running of this project. In this way afforestation program will get a new pace for running, which in turn will be beneficial for the environment as well as for the mankind.

Dr.Sadhu established an herbal garden and an organic kitchen garden in Bolpur High School. In the herbal garden many common and endangered species of medicinal plants are conserved. Their utility is explained to the students regularly. The products of organic kitchen garden are used in CMDM program. It adds extra nutrition to the students.

i.e, Sapling Bank, in the name of legendary environment worker, recently passed away, Sundarlal Bahuguna. In this way the students will get the opportunity of knowing about the contribution of Sundarlal Bahuguna in the field of environment protection. Seeds of different native plants of this locality like, Shal, Teak, Mahuya, Bokul, Piyal, Arjun, Krishnachura etc are sowed in the campus for making saplings. Anybody or any organization can set these saplings for plantation, free of cost. Anybody can donate saplings in this bank also. Sundarlal Bahuguna Sapling Bank, an initiative of Bolpur High School Eco Club will look after the plants and the willing persons may get these saplings from this bank. This is a pioneer project in this district. The Divisional Forest officer, Birbhum also praised this innovative idea and assured their assistance for smooth running of this project. In this way afforestation program will get a new pace for running, which in turn will be beneficial for the environment as well as for the mankind. The program is initiated in the last World Environmental Day i.e, 5 th June, 2021, but within a very short span of time, it created huge demand for the tree lovers of this locality.

Within the Bolpur High School campus Dr.Sadhu designed to display different study materials wisely. Here the concept of the angle is displayed in the floor of classrooms, the contribution of tree and plants to the society is also displayed, human evolution series is displayed in the stairs, traffic signals are displayed at the entrance point, a wind vain is installed at the roof top and a fossil gallery is also made at the school campus. Many working models of Science subjects are installed within the school campus. In this way the school itself became a TLM to the students.

Bolpur and its adjacent area is lying within the geographical area of Rajmahal hill area and Chhotanagpur plateau. The soil type is lateritic here. During digging of soil for any constructive work or making of pond, wood fossils are discovered often. Dr. Sadhu and his team decided to make a wood fossil gallery in the school by collecting these fossils. After getting permission from the forest department, they started to collect the fossils and as a result of intensive hard work of last six months they are able to collect 25 wood fossils from the nearby village area. As per the opinion of the experts, these wood fossils are of late myocin era, i.e, 15 to 20 million years old. Most of these wood fossils are of Anacondiaceae, Combretaceae, Leguminosae plant family.



These fossils are of great paleobotanical value. These valuable specimens are kept in the school by constructing an open air Fossil Gallery. This Fossil Gallery is named by the pioneer Paleobotanist of the Indian Sub continent, Prof. Birbal Sahni. Dr. Sadhu is pioneering this district by making such a fossil gallery in any school. The students will get the opportunity of studying fossils practically and free of cost, which is very much beneficiary for any student, irrespective of any school and any gender. On the other hand the fossils will be conserved from decay and misuse by people.

Dr. Sadhu performs his day to day work by riding bicycle. He goes to different Govt. offices for school related works by riding bicycle, even to the district Headquarter Suri, which is 35 kms far from Bolpur. In his version, the benefits of bicycle riding are, it saves consumption of fossil fuel, it decreases air pollution, it keeps the bodyfitness and it also saves money. He not only says, but campaign by writing these words on his bicycle. He also wrote some slogans on his environment friendly vehicle like Plant Trees, Save Environment, and Reject Plastic. He is well known in the locality for his great idea and his modified bicycle.

Dr.Sadhu is an environment activist since beginning. Around 30 years ago when he joined Barala R.D. Sen High School, the school campus had a very few trees. Dr.Sadhu planted around 30 trees in the school campus. Those trees are still in that school campus and make the campus greener and beautiful.

Dr. Sadhu is the District Academic Coordinator of National Childrens Science Congress, a DST sponsored initiative to build scientific

temperament and research ability among the school going children, since 2010. Under his active supervision this program is now very popular among the students of this district. Inspired by getting exposure through this program students and teachers regularly participates in other different Science activities also. He is also the Sub- Division Vice President of Paschim Banga Vigyan Mancha which deals with eradication of superstition, which crafting etc. in the society.

Many government and non-government organizations have given him recognitions for his innovative works such as Rotary International, University of Engineering and Management, Bidhan Sishu Udyan, Science Olympiad Foundation, Science Communicators Forum, Anandabazar Patrika & Peerless Group, Zee 24 Ghanta Media and IARDO (international).





Jungle Rhythms Green School Award 2023

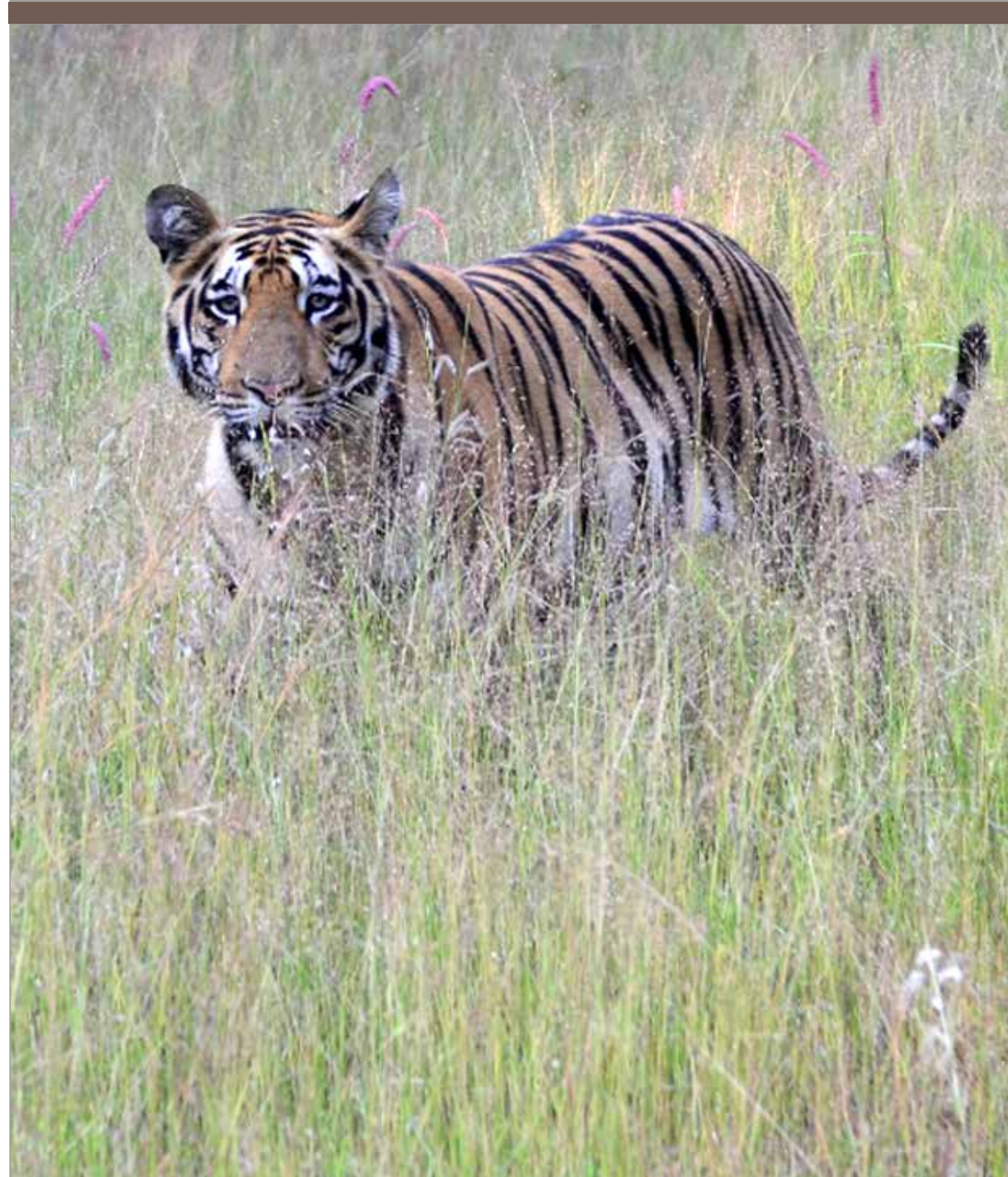


Jungle Rhythms Green School Award 2023 has been bestowed to our heritage school of Birbhum - Bolpur High School for their adoption of a green agenda and continuous initiatives towards making the students aware of environment complications and small steps to restore the natural balance.

Under the strong leadership of now ex-principal Dr. Supriya Kumar Sadhu, Bolpur High School has attained

high levels in academic excellence and eco-friendly lifestyle. The school was adjudged "Best School" in West Bengal by the Government of West Bengal in 2016. Students of this school regularly secure their position in state top 10 in class 10th and 12th board examination.

Jungle Rhythms hopes that many other schools will follow Bolpur High and help make better citizens with green minds. **JR**





Jungle Rhythms

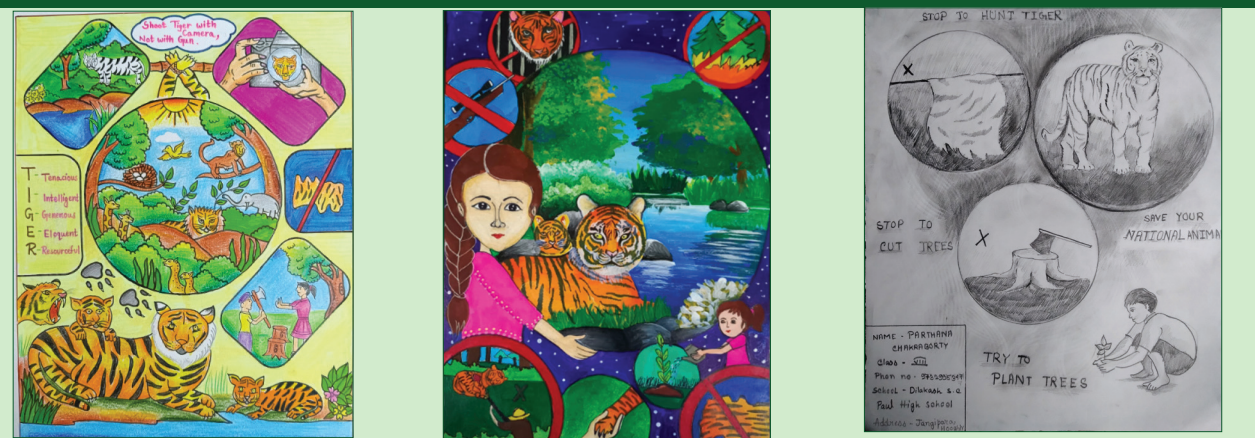
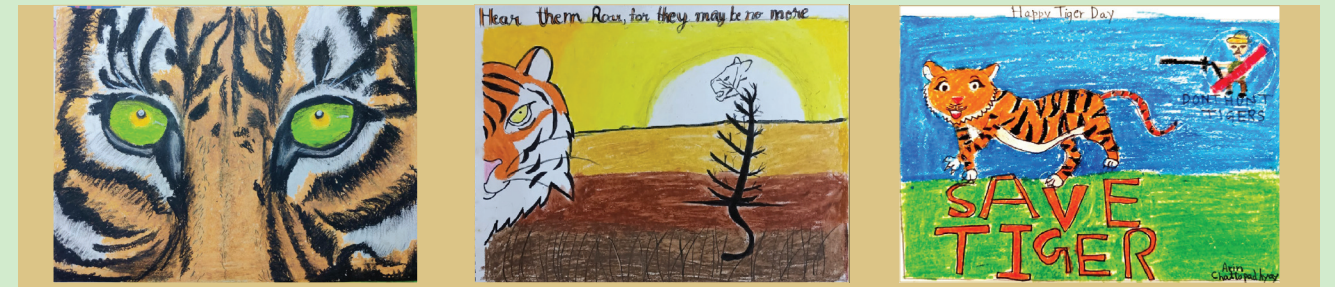
Global Tiger Day Competitions 2023

Jungle Rhythms proudly announces the results of the Global Tiger Day Online WildArt Competition. We received great responses and all the submissions were great and were a perfect representation of how our future generations think about the "tiger subject".

Jungle Rhythms decided to award the green artists in 2 groups (Group A - 13-15 years and Group-B - 10years-12 years) to encourage and inspire more lovely minds.



JUDGE'S CHOICE AWARD: Shreyank Bhowmick
SPECIAL MENTIONS: Avani Athalye, Soumya Narang, Arin Chattopadhyay, Nidhi Sanjay Mankar, Navya Wadhai, Durga Borkute, Kaveri rahul Sakhare, Sanika Tadghare

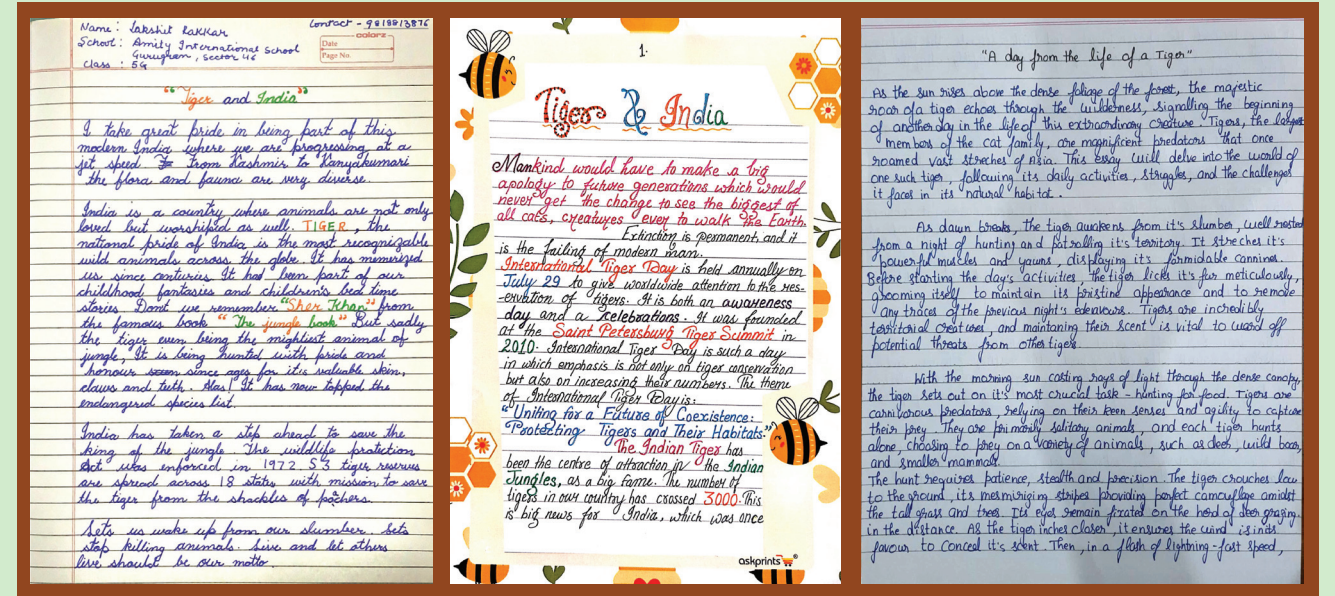


FIRST: Ananya Rout (Class 9) SECOND: R. J. Harini (Class 9) THIRD: Parthana Chakraborty

GROUP-B



FIRST: S. Abhinav (Class 6) SECOND: B Divyadarshini (Class 5) THIRD: Thyakshwa (Class 5)



Lakshit Kakkar Aaradhya Priya Varad Kumar