



## WHO CONSERVES INDIA'S TIGERS

Recalling some of those, with whom this writer had interacted, considered responsible for creating Project Tiger in India during 1973.



*Fiddling with radio transmitters, Mike H. Pandey, Fateh Singh Rathore and Harsh Vardhan at Ranthambhore's Jogi Mahal during late 70s, HV's records*

**By Harsh Vardhan**

***Harsh is a citizen advocate for wildlife conservation and is based in India. -- Editors***

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Why do people follow birds more? Because birds are found all around but wild animals dwell in forest regimes so one's liberty to observe them faces usual governmental restrictions.

My first visit to Ranthambhore Tiger Reserve was during 1973 winter when Prince Bernhard of the Netherlands, then President of WWF – International, was on an inspection-tour. I had hired a

“tonga” from railway station to reach the spot deep inside the Reserve where the prince was camping: Jogi Mahal.

**Class apart:** Next, I visited Bandipur, reaching by a bus heading to Ooty. On opening the forest rest house window next morning, a few hundred Spotted Deer got startled; they were grazing at the lawn. The forest guard knocked at the door to convey I am invited for breakfast in the next room. Maharaja of Sandur was my surprise host! This wildlife expert told me he had inquired who else was staying there. M. Krishnan joined soon after. The class was to disappear at a faster pace.

A felt-hat over his head and oft-twirled moustaches across dark cheeks: trade-mark demeanour! Fateh Singh Rathore had established his impress at Ranthambhore during 70s. He simplified most challenging tasks in realm of Tiger Conservation. He was a born zealot. I consider he did what no one else could attempt: (i) first ever dirt-tracks caused inside jungles (ii) fashioned up a lost wetland (iii) started rehabilitating villages (iv) faced baton-attack over his body from unruly grazers, etc.

**Kanha's yeoman:** Must I point out that much before the Project Tiger noun had been adopted, some off

*Continued on page 2*

beat interventions had been made at Kanha. Not by a forest officer but by the one belonging to the Indian Administrative Service (IAS). As Collector and District Magistrate for Mandla, MK Ranjitsinh ji revamped Kanha's ecosystem: village relocation to enable prey-predators enjoy more space, expanding total geographic area of tiger habitat, etc. The former Minister, Jairam Ramesh's book, "Indira Gandhi: A Life in Nature" describes how, within three months, he drafted India's first ever Wildlife Protection Act in 1972 and then established Project Tiger in 1973.

Kailash Sankhala, a forest officer, took over as the first Director of Project Tiger. He enjoyed a braggadocio complex: "I did it!" Both MK Ranjitsinh ji and Sankhala shall be remembered for having scripted preface to a Desert Park in the Thar. As per habit, Sankhala over shot, declaring it as a "National Park." Its ills are being faced by all to this day.

**Sundry growth:** Past fifty years have caused a mushroom-growth of sundry faces claiming to be wedded to Tiger Conservation. Is there an authority to administer such a gathering for what one should do? The nation should know who will be booked for the wrong being committed at all the 53 Project Tiger Reserves. Also, why forest authorities do not pay heed to non-government experts who are willing to transfer their know-how and do-how, at no cost. Nature Guides, Drivers and Forest Guards amass an incalculable knowledge base by virtue of their being inside the Reserves maximum hours. Who cares for them?



*Dr. Ranjitsinh ji Wankar, founder of project Tiger*

Now a days, euphemistically, a hotelier is also into Tiger Conservation as much as a biologist. Almost every week, a new non-government organization is set up to confess saving this predator. The forest officers have no control over such insurgent advances around Tiger Reserves. It is gathered that some of the green hats happen to patronize such new buds. The press derives carrion comforts. E.P. Gee, Dr. Karan Singh, M. Krishnan, Saroj Raj Chaudhary, Charles Mc Dougal, Anne Wright, and Duleep Mathai, I like to recapitulate roles of some of the experts as India celebrates golden jubilee of Project Tiger. Access to Indira Gandhi, then Prime Minister, was not a difficult proposition. Both forest and wildlife were administered by Ministry of Agriculture. I recall visiting Krishi Bhawan to meet the (not so friendly) Joint Secretary, N.D. Jayal succeeded by (an humble and supportive) Samar Singh. Sankhala's guts led him to procure a room in Shastri Bhawan to open the account for Tiger Project.

**Science centric:** Kudos to Wildlife Institute of India and to all those (like Samar Singh) who established

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## STRESS vs SCIENCE

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It had been queer silence in all Tiger Reserves all over India since June end.

The annual holiday is observed for three months

when tourism is given a halt. Post October, the Reserves started reverberating with vehicles zooming in directions with singular objective: spotting Tigers. The tranquility of forests received a different voice.

**Tourism:** is it the lone pressure on Reserves, nay Tigers? This edition of CTIMES has tried to throw light on what surrounds Tigers – villagers, cattle catching attention of predators, agricultural practices, tourism inside the Reserves, etc.

Which of these factors weighs more in terms of causing stress on Tigers? Reliance on belief or be led by science?

The stress causes increase in "glucocorticoid levels" of Tigers.

It can negatively impact growth, reproductive success, immunity, and cause muscular atrophy.

It has been pointed out in a study undertaken by the Laboratory for the Conservation of Endangered Species (LaCONES) at CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad.

"If it continues it will have a definite impact on the population in the long-term" it stated.

Stress hormones from tiger scat samples in Bandhavgarh and Kanha Tiger Reserves in Madhya Pradesh revealed that the charismatic cats are highly stressed during the tourist season compared with the non-tourism period in both reserves.

## THEME FOR THE NEXT ISSUE

In addition to our ongoing emphasis on the tiger this year, we will also continue to focus on a different theme for each issue of CT. The theme for the next issue is Bird population on Decline, reasons?

As usual, we welcome good articles on any wildlife or environmental topic in addition to those on the theme for the upcoming issue. If you would like to write an article, please request a style sheet for Conservation Times from [emccrea@eecg.org](mailto:emccrea@eecg.org).

The deadline for submitting articles for the next edition is the 30 November 2023.



it at Dehradun. Scientific fervor thus got ingrained for wilderness conservation. Role played by the US Fish & Wildlife Service will need to be eulogized. David A Ferguson and Edward J. McCrea often flew in to India to transfer the US know-how. The gates of the US Embassy's Science Office never appeared closed.

Admire the little-eyases of Indian Forest Service. Only some undergo sessions at the Wildlife Institute. By the time they become adult, they get transferred. They say, tiger conservation rests in their hands. They roam around in polished

safari vehicles equipped with Wi-Fi sets. Forest Guards continue bicycle-patrolling. At the "chowkies" (outposts) they reside with aboriginal facilities.

And the Ministry of Forest and Environment (MoEF)? We saw it taking birth at Bikaner House in New Delhi. Now it dons more hats. Be reminded that a vibrant gamut of science-practising experts has assumed a very active role, in the private sector? Some call themselves Conservation Biologists.

Like the rabid, Dharmendra Khandal facing predators and

poachers at Ranthambhore's threshold.

**Who does it:** Three cheers! The Indian Tiger is conserved. Thanks to village folk around all the Reserves who tolerate marauding of their crops at night by Wild Boars and at day by Bluebulls? Wilderness relishes own perils to have re-birth. Humanity walks through "cunning passages and contrived corridors" (apology to T.S. Eliot).

Corridors? The very word can upset those who are enshrined with the task of Tiger Conservation, in India! Amen.

# TIGER RESERVES DOGGED BY HUMAN-CATTLE PRESSURE



*Ramganga river at Dhikala in Corbett Tiger Reserve, D. Momaya*

## ***By Conservation Times Editors***

**An assemblage of data on state of India's Tiger Reserves from various reports of the National Tiger Conservation Authority (NTCA) – Editors.**

Six villages having a population of 2,486 in the Bandhavgarh National Park and 8 villages having a population of 3,674 in the adjoining Wildlife Sanctuary exert immense pressure in the core area.

In the Bandipur Tiger Reserve, even the sanctioned strength of frontline staff is inadequate. The norms need to go beyond simple archaic standards and need to be based realistically on functions, terrain

difficulties and the nature and intensity of pressures. Role assessment is essential.

**Decision missing:** The Nagarhole Tiger Reserve has chronic problems and needs administrative and policy level serious thinking.

In Bori-Satpura Tiger Reserve, there are 20 villages inside the reserve, which are proposed to be relocated. There are 54 villages in the periphery that exert pressure on the reserve. Nearly 21,500 cattle are located inside the reserve.

In Buxa Tiger Reserve, fringe areas have 30 revenue villages and 33 tea gardens outside the reserve boundaries. The cattle population is

estimated to be about 100,000 heads.

**Biotic pressure:** In Indravali Tiger Reserve, there are all kinds of biotic pressures due to the presence of 56 villages in the core area. Tribals are nearly primitive and depend on forests for their livelihood.

In Kalakad Mundantharai Tiger Reserve, five Kani habitations are present as a threat to ecosystem. Electricity Board, Irrigation Staff Colony/unauthorized labour shanties also exert pressure.

Kanha Tiger Reserve has been pioneering in relocation of villages from the core area. The efforts were initiated in 1967. The sites vacated



*A usual scene at Tiger Reserves, tourists chasing predators, HV's record*

by the villages were developed as meadows and some of the prime swamp deer habitats are today on these sites.

**Habitation:** Manas Tiger Reserve has encroached human habitation over 1600 hectares and 500 households live there.

In Melghat Tiger Reserve, there are 19 villages having 1563 families out of whom only 40% have land holdings. All these villages have sizable human and cattle populations, and cultivation is practiced in all the villages.



*People face a Tiger across the road in Ranthambore Tiger Reserve, HV's records*

In Nagarjun Sagar Sri Sailam Tiger Reserve, 'Chinchu' tribal settlements live in the core area. Due to the Naxalite problem the reserve is generally closed for tourism. There is a large inflow of pilgrims visiting the holy shrine of Sri Sailam.

**Livestock:** In Namdapha Tiger Reserve, 28 Lisu families in 2 habitations continue to exist. Some more huts have come up on the M.V. route. Livestock pressure is there in adjoining areas.

In Panna Tiger Reserve there are 13 villages situated inside the core area with 5,753 human population and 7,104 cattle population, exerting considerable pressure on the reserve.

In Pench Tiger Reserve, number of villages in the immediate vicinity of the boundary of the core is high: 35 villages are within 1 km., 16 between 1 and 2 km, 35 between 2 and 5 km and 13 above 5 km but less than 6 kms. They cause adverse influence on the ecosystem.

**Still incomplete:** Ranthambore Tiger Reserve would have been village-free had the forest department's proposals received

consent well in time. Yet significant pressure of rural folk has been removed within the core area barring a few settlements yet to be relocated.

The Sariska Tiger Reserve has numerous villages and an estimated population of a quarter million cattle. Beyond the buffer (5 km radius), it is a sea of humanity.

In Simlipal Tiger Reserve collection of non forest timber produce is confined to tribal population living in the core area for their bona fide use.

In Tadoba Tiger Reserve, there are 59 villages in the immediate vicinity with 37,434 human and 39,716 cattle population. About 60.15 km boundary of the Reserve is porous, coming in direct contact with the villages and cultivations.



*Rhinos live along with Tigers in Kaziranga National Park, Kangkan*



# UNSUNG HEROES IN WILDLIFE CONSERVATION IN INDIA



*Trackers in backdrop of Asiatic Lion pride, Dr. Deven H. Chauhan*

**By Sunny Shah**

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This article sheds light on a group of individuals who often go unnoticed despite playing a pivotal role in wildlife conservation. While we admire renowned wildlife scientists, conservationists, and photographers for their contributions, it's crucial to acknowledge the unsung heroes working behind the scenes—the locals from the jungles. These individuals, often referred to as trackers, animal herders, or daily wage workers, provide invaluable support to researchers, writers, and experts in the field.

In our admiration for notable figures in wildlife conservation, we tend to overlook the local communities residing in the jungles. These individuals, much like the legendary Dersu Uzala from VK Arseniev's Russian classic, have accompanied and assisted researchers and experts in their expeditions. Take, for instance, the trackers from the Gir forest or the Pardhi community in central India. Their contributions are no less than those of Dersu. Regrettably, only a few receive recognition from their counterparts, just as Arseniev praised Dersu in his book.

**Know-how base:** Throughout history, locals from Indian jungles have spent their lives collecting

wood and tracking animals, often labeled as "subaltern shikaris" during the colonial era. British officers referred to them as hunters thrust into subordinate roles, serving as shikaris, guides, trackers, beaters, porters, and camp servants for British sportsmen. None of the taxonomic adventure of British officers would have been completed without them. Later, they became employed by erstwhile princes, aiding them as beaters, animal spotters, and informants. Even natural history historians relied on local assistants during their expeditions.

Personal experiences in the Indian forests have revealed the vast knowledge possessed by these local communities. On one occasion,



*Local Trackers know the best about wildlife, Sunny Shah*

while exploring the Kanha Tiger Reserve, we encountered a cryptic footprint that puzzled everyone. It was a Pardhi boy working alongside me who excitedly exclaimed, "Yeh udbilav ke hai!" (This is the footprint of an otter.) Due to language barriers and the lack of modern equipment, these individuals often struggle to convey their profound knowledge. Despite their extensive understanding of forest ecology, animal behavior, movement, and prey, their contributions remain largely unacknowledged.

One group of local heroes that deserves special recognition is the trackers from the Gir forest in India. These individuals have developed an unparalleled expertise in tracking lions. Their knowledge of the jungle and its inhabitants is remarkable, enabling them to identify lion tracks with astonishing

accuracy. Whether the tracks are imprinted on a leaf or hidden beneath unturned stones, these trackers can decipher the subtlest signs left by the majestic predators.

Their deep connection with the land and their innate understanding of the lion's behavior makes them invaluable allies in lion conservation efforts. Their remarkable abilities highlight the importance of recognizing and celebrating the local communities who possess such unique skills and knowledge.

**Local genius:** The locals' immense knowledge of the jungle, wildlife, flora, and seasons has been exploited in various ways. They have earned meagre wages to support their multiple homes, yet their invaluable insights remain absent from research papers and coffee table books.

The true heroes of wildlife conservation are these individuals who provide researchers and writers with firsthand information about species and their habitats. Although scientists and historians have translated this knowledge for broader consumption, it is crucial to recognize the efforts of those who work tirelessly on the ground to enlighten us.

In our pursuit of wildlife conservation, let's not forget the local communities who possess a wealth of knowledge and play an indispensable role. By acknowledging their contributions and giving them the recognition they deserve, we can ensure a more inclusive and comprehensive approach to conservation. Let's celebrate these unsung heroes and their profound connection with nature, for they are the custodians of our wildlife heritage.



# NAMDAPHA FAUNA AT WHOSE MERCY?



*Forest clad with snow in Namdapha Tiger Reserve, Rohit Naniwadekar*

## ***By Editors of Conservation Times***

MK Ranjitsinh, a former officer in Government of India and wildlife expert, had following to state in his observation-report on Namdapha Tiger Reserve.

“.... no officer nor staff have ever visited the eastern border of Namdapha such as the Tushar Valley and the upper region of the

Daphabum area, even in the summer months. “As a result, no one can say what situation is there in the remoter areas of the park and whether there are any encroachments or poaching camps etc in these areas. There is no complete survey of the fauna and avifauna of the Tiger Reserve.

“No one knows whether in fact there are any snow leopards or bharal in the upper reaches, or whether in fact there are takin and whether the hog deer which were reported in the grasslands close to Farmbase in 2000 are still there or not.

He added: “There would be footprints in sandy patches and muddy bottoms of valleys, calls of vocal animals especially the Hoolock Gibbon and the noisy flights of birds and their calls.

“During my two-day walk, I heard Gibbon call only thrice and saw just one specimen. In my previous visit 19 years ago, every morning was a cacophony of Gibbon calls.

“Unlike my last visit when I saw large numbers of the larger Hornbills -- the great Indian and the pied, I saw none this time, only the smaller and more common rufous-necked and the wreathed.”



*A Great Hornbill in flight, Tribune*



*Hoolock Gibbon, Roundglass*

# COMMUNITY LED EVIDENCE-BASED ADVOCACY ADDRESSING BIODIVERSITY THREATS IN KENYA



*National Museums of Kenya ornithologist demonstrating bird's identification to Mumoni SSG members during Hinde's Babbler Survey, photo by James Mutunga Joshua*

**By Peter Njeru, Partner in Nature Kenya**

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Mumoni and Mutitu Forest Reserves, in Kitui County, are some of the species-rich dryland hilltop ecosystems. The Hinde's Babbler (*Turdoides hindei*), a Kenyan endemic bird species, occurs in both hill forests, which are home to other species of conservation concern including the Endangered Martial Eagle, African Crowned Eagle, and Afro and Palearctic migrants. Both

hill forests are listed as Important Bird and Biodiversity Areas (IBAs) and Key Biodiversity Areas (KBAs), and are surrounded by a growing rural agrarian human population.

**Only 42 Babblers:** A rapid survey of Hinde's Babbler was conducted in Mumoni and Mutitu Hill forest during dry and wet seasons in 2022 with support from African Bird Club. The survey recorded the numbers of the globally threatened bird, and mapped its habitat patches in both sites. Although conducted in less than a quarter of the KBAs' total area, surveys recorded a total of 42 individuals.

Ten members of local community based organizations commonly referred as Site Support Groups were engaged. Their involvement aimed at promoting citizen science, integrating use of traditional knowledge in the surveys and boosting their understanding on scientific methods of monitoring ecosystems.

The major threat to the species is the steady decline in their suitable habitat patches for breeding, vegetation cover and the fast-changing land use patterns in range regions. The species is highly selective in habitat occupancy, preferring shaded areas with dense thickets along riverines or valleys.

**Dense thickets:** They prefer dense thickets cooled by shading, and litter cover from where they forage for insects.

Unregulated cut and burn, agricultural practices near forests, and clear cutting of dense thickets in the neighboring farmlands for home establishments are the threats observed both within the forests and in the adjacent private land.

Continuous monitoring to cover the entire forests areas was identified as a future opportunity to enrich the



*Three members of Mumoni SSG exhibit during World Desertification and Drought Day 2023 at St. Pauls Waita secondary School in Mwingi, photo by Peter Njeru.*



survey findings. The two site support groups were sensitized to upscale advocacy to win community and local government support for nature.

**Nature Kenya:** The communities have since participated in different initiatives such as the May 2023 Global Big Day; going out in the field, actively searching, watching, recording birds in their local names, while Nature Kenya experts assist in translation and submission of data to e-Bird mobile-based citizen science App.

The communities utilized the results of the survey to contribute to

the County Integrated Development Plan (CIDP) formulation process.

The County Government in the draft five year 2023 - 2027 plan has recognized the IBAs/KBAs and commits to enhance expansion of drought tolerant trees population, hillslope rehabilitation, promote IBA/KBA tourism, legislation and protection in these ecosystems.

The groups also utilize important international days to carry out market barazas (place where public meetings are held) and school outreaches to sensitize and educate the public on environmental conservation.

During World Desertification and Drought Day 2023 national event, the Mumoni SSG showcased their conservation initiatives.

**Award:** This caught the attention of the Cabinet Secretary, Ministry of Environment, Climate Change and Forestry and it recognized the group's efforts in restoration and awarded them a certificate.

Nature Kenya continues to support capacity building for the locals on biodiversity conservation. More surveys are required to provide more information on the bird species distribution patterns over time.

## SPRAY TEST BETTER THAN SCAT ANALYSIS



*Spray by a Tiger, Kola Venkateswarlu*

### **By Conservation Times Editors**

The DNA taken from tiger spray is just as good or even better at identifying individual tigers and their gender than is using DNA from scat-the “breadcrumb” that researchers have traditionally used to track the endangered animals.

It has been demonstrated by scientists at the National Museum of Natural History (NMNH) and the wild-cat conservation organization Panthera. The findings are published in the journal

Conservation Genetics Resource.

Because this spray - a combination of glandular secretions and urine - is detected much more frequently in the wild than scat, the work has the potential to increase the power of conservation surveys and management. It is the first time a technique has been developed specifically for the use of sprays in genetic analysis.

**Priority:** “Genetic monitoring of tiger source populations is a conservation priority,” said Anthony Caragiulo, a postdoctoral researcher in the Museum's Sackler Institute for Comparative Genomics. “The utility of this new method is really impactful because it will let us dramatically build upon the number of tigers that can be surveyed and, consequently, increase our understanding of these elusive animals-hopefully before they are gone.”

Despite intense conservation efforts, there are about 3,200 tigers in the wild, living in less than seven percent of their historical range. When a population is confined to small islands of wilderness, as are tigers, there is a higher risk of inbreeding and loss of genetic diversity, leaving the species with

weaker young.

To combat this, the Museum has been working with Panthera to establish “genetic corridors” that allow tigers to seek new territory for prey and new populations for breeding. Tracking individual cats using genetic markers lets researchers map their movement within and between populations.

Genetic tracking has traditionally relied on extracting DNA from scat collected in the wild.

**Problem:** But in humid, tropical landscapes - like those in Sumatra, where a number of tigers live - scat often degrades before researchers can find it. Scent sprays left by tigers on trees and over hanging leaves degrade less quickly and can be detected by researchers between two and eight times as frequently as scat. So, to boost the effectiveness of genetic monitoring of tigers in warm regions, the research team asked whether DNA could be extracted from sprays.

The researchers collected spray samples from three captive tigers in Ontario with cotton swabs that were then stored in tubes of buffer to help preserve the DNA. Tiger spray is a combination of anal gland secretions.

# TOURISM CAUSES STRESS TO WILD TIGERS



*What tourists do at Kaziranga, causing stress to Tigers, forest source*

**By Tyagi, A., Kumar, V., Kittur, S., Reddy, M., Naidenko, S., Ganswindt, A., & Umapathy, G. (2019). Physiological stress responses of tigers due to anthropogenic disturbance especially tourism in two central Indian Tiger Reserves. Conservation Physiology, 7(1), co2045.**

Stress hormones from tiger scat samples in Bandhavgarh and Kanha Tiger Reserves in Madhya Pradesh have revealed that the charismatic cats are highly stressed during the tourist season compared with the non-tourism period in both reserves.

While the National Tiger Conservation Authority (NTCA) stipulates a maximum of 40 vehicles should be allowed in tiger reserves per day, the research team noted that both reserves accepted much higher numbers per day on average.

The study authors recommend more stringent regulation of vehicular

traffic, number of tourist vehicles, shifting of artificial water holes away from tourist roads and reducing other anthropogenic disturbances, including the relocation of villages from the core area of tiger reserves.

**Impact on breeding:** Ever wondered how tigers feel in response to hordes of vehicles ferrying tourists eager for the thrill of a perfect close-up encounter?

A study examining stress hormones in tiger scat collected from two popular central Indian tiger reserves has revealed that these iconic carnivores suffer from high levels of physiological stress due to wildlife tourism and a large number of vehicles entering the parks.

Prolonged stress can adversely affect both survival and reproduction. "Chronically elevated glucocorticoid levels can negatively impact growth, reproductive success, immunity, and cause muscular atrophy," explained senior author Govindha Swamy Umapathy

who is a principal scientist and project leader at the Laboratory for the Conservation of Endangered Species (LaCONES) at CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad.

"If it continues it will have a definite impact on the population in the long-term" it stated.

Both Bandhavgarh and Kanha tiger reserves are surrounded by a matrix of forest and land used by humans. Fifteen villages inside Bandhavgarh Tiger Reserve harbour over 6,000 people and a livestock population of 11,000. Similarly, the buffer zone of Kanha Tiger Reserve is home to around 129,000 people and more than 85,000 cattle.

**Scat tests:** In 2015, the researchers scooped up 206 tiger fresh scat samples during the tourism period between January and March and the non-tourism period, the month of September. From these samples, they extracted glucocorticoid metabolites. These are steroid hormones that are released when the





*How close do you want to go, a scene at Bandipur Tiger Reserve, forest source*

animals are stressed. They quantified their concentrations using a cortisol enzyme immunoassay. They also determined the gender of the tiger to see if there are differences in the concentrations between males and females.

For disturbance levels due to tourism, the team gathered data from the forest department on the number of vehicles entering the parks and tourist footfall. As both reserves have multiple routes and points of entry for vehicles, sample locations were classified as 'high', 'moderate' and 'low' depending on the presence of livestock and villagers; wood cutting and logging; and vehicular movements.

“Non-invasive fecal sampling and assessment of glucocorticoids provides a reliable animal-welfare friendly method for tracking the stress levels of cryptic wildlife species such as the tiger,” said Edward Narayan, senior lecturer of animal science at Western Sydney University, who was not involved in the study and specialises in non-invasive reproductive and stress endocrinology.

**Ecological factor:** Tigers exhibited higher levels of glucocorticoid metabolite concentrations in both reserves during the tourism period

compared with the non-tourism period, meaning that they were more stressed when tourists are around. And while the authors had anticipated a slight increase in stress, what they found was much higher. “It was expected to be a slight increase but a significant increase was recorded,” Umapathy said.

They did not find any significant differences in the glucocorticoid metabolite concentrations between males and females during both tourism and non-tourism periods.

“Stress plays a pivotal role in the ecology of wildlife species and increased perceived stressors in the wild. For example, human-induced disturbances can cause significant changes across the brain-endocrine-tissue pathways leading to over-expression of the stress biomarker (cortisol),” explained Narayan. “Cortisol can have life-long significant negative impact on all aspects of wildlife ecology including growth and development, maturation, reproductive fitness, behaviour and survival.”

What's more, the glucocorticoid metabolite concentrations grew higher in Bandhavgarh Tiger Reserve as the level of disturbance and the number of vehicles increased.

**Big rush:** Bandhavgarh Tiger Reserve received 106, 535 visitors while Kanha Tiger Reserve accepted 137, 644 people during a 9-month long tourism season from October 2014 to June 2015. To travel inside the reserve, an average of 85 vehicles were used per day in the former reserve and the latter accepted 106 per day.

Tourism is restricted to only 20 percent of the core areas of the reserves and a maximum of 40 cars per day are permitted as per guidelines laid down by the National Tiger Conservation Authority (NTCA) in their 2010 management plan.

While the authors did not quantify how much of the core area was used for tourism, they noted that it appeared higher than the 20 percent suggested by the NTCA. Additionally, they pointed out that both reserves have permitted much higher numbers of vehicles than the 40 recommended by the NTCA, especially Kanha Tiger Reserve, which allowed an average of 106 vehicles per day.

**What next:** The findings have implications for the management of reserves and conservation. Some of the measures advised by the authors are more stringent regulation of vehicular traffic and the number of tourist vehicles entering the reserves; shifting of artificial water holes away from tourist roads; and reducing other human disturbances, including the relocation of villages from the core area of tiger reserves.

Umapathy also highlighted the need to conduct similar studies in other Indian tiger reserves and also to examine the impact of increased glucocorticoid metabolite concentrations on the reproductive potential of the wild cats in the long-term.

**Source:**

<https://india.mongabay.com/2019/10/tigers-highly-stressed-during-the-tourist-season-in-central-indian-reserves/>

# WHAT IS WRONG WITH THEIR BEAKS & KNEES?



*Red-wattled Lapwing, affected by Avian Pox, Durga Lal Verma*



*Yellow-wattled Lapwing affected by Avian Pox, Durga Lal Verma*

## ***By Conservation Times Editors***

**A bird expert and photographer, Durga Lal Verma spends each Sunday going out to explore what new birds were around at various water bodies in a radius of about 100 km from city of Jaipur. He has been following it for nearly fifteen years. He is closely associated with TWSI (Tourism & Wildlife Society of India) and prefers to describe himself as a volunteer.**

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At Nevta dam, he noticed legs and beaks of Lapwings were bit swollen. He photographed the birds and shared with Conservation Times. Red-wattled Lapwing as well as Yellow-wattled Lapwing were the patients. Veterinary experts were consulted, sharing the photos. They stated it was Avian Pox. Was it a serious issue, he probed.

Dr. Monika Chaudhary, Veterinary Surgeon associated with TWSI, explained that Avian Pox is a viral disease that is believed to affect

most bird species, with cases of pox reported in approximately 230 wild and domestic species. The disease can be highly contagious and may take time to show symptoms after a patient is infected, so it can pose a challenge to wildlife rehabilitators whenever an outbreak occurs in their facilities.

Transmission mainly occurs when viral particles enter the body through an opening in the skin. In the wild, it is most commonly spread through the bites of insects such as mosquitoes, flies, mites, fleas, etc. The virus may also be contracted through contact with an infected animal or a contaminated surface such as bird feeders and birdbaths. In a wildlife rehabilitation center, this may include branches or perches, nests, food and water bowls, and toys. The virus may also be transmitted through aerosolized particles.

The most common clinical presentation seen is known as the dry or cutaneous form, and it consists of the appearance of wart-like lesions on featherless areas of

the body, including around the beak, eyelids, legs, and feet. In this form, pox develops slowly after birds become infected, and lesions usually persist for one to four weeks. Birds usually recover from this, and their lesions may heal with some scarring.

However, in some cases, the lesions may cause permanent damage such as blindness, malformations of the beak, or loss of digits and feet, depending on the affected area.

There is also a risk of mortality due to secondary bacterial infections, and young birds are more susceptible to having lasting defects than adults. In wet pox, or the diphtheritic form, mucus membranes may be affected, and the disease may spread to the respiratory tract. In the least common septicemic form (usually seen in canaries), the virus can lead to depression, anorexia, and death.

Having received medi-tips, Durga appeared bit happy. He is on lookout hoping no more patients to be observed and photographed. Well done, Durga.



# HUMAN –LEOPARD CONFLICT



*This leopard scaled up a village hut, HV's record*

**Dr. Monika Choudhary**

**Dr. Monika Choudhary is a practising veterinarian expert based at the Indian Council of Agricultural Research facility in Haryana. She is associated with Tourism & Wildlife Society of India (TWSI) and takes active role in rescuing injured animals-birds.-- Editors**

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Leopard (*Panthera pardus*) is a vulnerable species listed on IUCN red list because of its declining population. It has, however, been the most ignored big cat despite being majestic as well as vulnerable due to lack of efficient leopard conservation policy in India.

According to Wildlife Protection Society of India (WPSI) 298 leopards' deaths were recorded in 2023. Of these, 216 were mortalities and 82 were poaching and seizures. The causes are increasing human interference in its habitat, declining prey population,

poaching for skin, and automobile accidents across roads due to lack of leopard corridors.

The leopard caused damage and related cases are maintained by wildlife conservationists working in different states of India to address problem of this neglected majestic cat. There are increased cases of malicious poisoning and maiming by farmers in revenge or protection of their livestock and poultry. Due to pressure of ever-increasing human population, the size of habitat of leopard is shrinking. It leads to conflicts with humans.

**Hungry:** It has been observed that for lack of natural prey, the leopard has to dwell upon stray dog and livestock. Peacocks, gerbils, rats and even partridges are reportedly bagged by it. I tried to assess cases in which a leopard would have preferred a Bluebull. All through my travels into various forests e.g., Jhalana Reserve near Jaipur, I always found adult bluebulls having been almost face to face with leopards. Neither the prey was

apprehensive nor the predator took notice of a big meal at a short distance. I was told that young ones of bluebulls had been snatched by leopards.

For want of a sizeable predator, number of bluebulls is on rise all over India. Likewise, for want of adequate natural prey base, leopards are forced to slip into urban localities soon after sunset to pick up dogs, chickens, etc. Cause of concern for citizens and villagers. Does it make any sense to authorities?

As suggested by wildlife conservationists, the forest officials have adopted variety of methods to minimize menace by leopards.

**They include:** metallic fencing around livestock farms, providing compensation in buffer zones, monitoring and tracking leopard by help of local volunteers and non government organizations, engaging forest personnel in rescue missions, awarding punishment to poachers, educating locals about



*What treatment a Leopard receives when it finds itself in agri-fields, HV's record*

role of leopard in ecosystem and providing quick compensation to farmers for the livestock loss caused by this predator, etc.

**Sending where:** Relocation of leopards is a usual process adopted by forest authorities all over India. We are short of data. However, forest personnel are perplexed over combating leopard menace as twice a week they receive rescue-calls from villagers. Using a tranquilizing gun, the veterinary surgeon or a range forest officer must sit hours to wait for the reported miscreant animal. Often, they must put a live bait (goat) at the place they suspect the predator would report following evidences given by villagers.

Chances of the animal getting tranquilized are usually bright. The animal is pushed into a metal cage put over a tractor driven trolley and brought to the nearest zoo – as a new inmate. The forest officer, senior to such a ground level team, often orders it to be trans-located to a far-off area. They discuss about

destination – a degraded forest or on outskirts of a wildlife sanctuary. It is done. The problem of villagers and forest personnel seems to be over.

However, within days, the leopard reappears at the same spot looking for another goat or sheep within premises of the same village! It knew where it had been roaming around. It would like to hunt within that area. Translocation, therefore, cannot be treated as a final solution.

**Saving life:** Should leopard corridors be created to let the animals pass through own wild track as people may take over head road? The practice is prevalent in some parks in the US and Canada. It partly solves the problem as both grizzly bears and black bears.

However, the bears do not always walk over the flyway created for them and have practice to come against the fast-running cars of visitors. India has discussed partly such an issue and even Tiger Corridors have not received such a facility. Leopards remain wait listed.

Should we call it custodial-death – leopards losing their lives while in captivity with forest authorities? Lack of follow-up of good rehabilitation practices is a general complaint.

Rescue and relocation likewise remain questionable – facilities for the predator are basic. It receives strange trauma which humans hardly understand. It gets physically and mentally weak.

It become prone to aggressive behaviour. Mortality is inevitable when it must find feed in an alien habitat and naturally is victimized.

Uses of standard anaesthetic, sedative, and antidotes in proper doses for calming and relocating leopard are significant factors left to veterinarian experts only.

They remain ill equipped. Their surgery ward is likewise a room converted into operation theatre. Post anaesthetic recovery in field happens to be sensitive issue and deserves better facilities than are observed in practice.



# INTERSECTION OF CONSERVATION WORK ACROSS CONTINENTS



Laurie Marker with her favourite Cheetah, HV's source

**By Nandita Bhatnagar**

Email: nansluck@yahoo.com

Wildlife conservationists are critical thinkers who are passionate about preserving wildlife and their habitats. Their main objective is to understand and mitigate the impact of humans on wildlife and the natural environment. They push to bring awareness to biodiversity and sustainability among the public, serving as a mediator between humans and nature. The stakes are higher than ever as more species become endangered and forest fires continue to be a growing problem.

More than 60 years ago, Alexander "Sandy" Lindsay a local businessman from the city of Walnut Creek in California, shared his curiosity and passion for the natural world with the community, especially the children.

He started teaching neighborhood children about nature in the early 1950s. He soon drew parents in to help, along with other civic-minded people.

What started as a garage full of locally collected specimens, and the occasional wild animal, slowly developed into a series of informal classes and neighborhood hikes.

Initially housed in an elementary school, the initiative became a museum which began offering

school age children summer classes and field trips focused on the natural world. People started coming to the museum for assistance with wild animals that had been injured or orphaned because of intense urban growth and the loss of native habitat.

Thus year 1970 saw the addition of a wildlife hospital, and its veterinarians, husbandry experts, biologists, and teachers who offered treatment for more than 5,000 wild animal patients, care for the 70 animal ambassadors and education of around 100,000 people.

As the years have passed, this truly grassroots organization started by one individual has continued to grow and is now known as the Lindsay Wildlife Experience and is still in the city of Walnut Creek, California. More than 50 species of live, non-releasable, native California animals are on exhibit. Tens of thousands of children learn about the environment in their classrooms through traveling education programs and on-site tours of the museum.

Nature and science-oriented classes and trips are offered for adults and children.

I live in neighbor city San Ramon and visit the museum with my children a few years ago where we attended a lecture by Dr. Laurie Marker of the Cheetah Conservation Fund (CCF). She grew up in California and worked several years at Wildlife Safari and helped develop the U.S. and international captive breeding program for Cheetahs (cheetah studbooks). She established the most successful captive Cheetah-breeding program in North America.

During her first trip to Southwest Africa (Namibia), Laurie found that livestock farmers were catching

hundreds of cheetahs in cage traps and killing them.

She decided to generate awareness for the cheetah's plight and created Cheetah Conservation Fund located in Otjiwarongo, Namibia.

Work done by these conservationists address the concerns for wildlife populations and the human communities that share the landscape. Additionally, CCF worked in an advisory capacity with the Wildlife Trust of India and India's authorities.

Discussions and strategies were focused on re-introducing cheetahs in India. In 2022 eight cheetahs from Namibia were sent to Kuno National Park in state of Madhya Pradesh to re-establish the species in the country.

I have since heard many chapters in a story of displacement and resilience for the livelihoods of the Sahariya people.

Located on the western edge of Madhya Pradesh's Sheopur District, Bagcha is a village of Sahariya tribals. They have been asked to move from Kuno to Bamura, about 35 kilometres from Bagcha. This forced exile can disrupt the livelihoods and everyday existence of these Sahariya people whose world is so closely intertwined with the forests.

This may sound like it is unrelated to conservationists like Alexander Lindsey and Dr. Laurie Marker, so far removed from Northern California in USA to Madhya Pradesh in India, but sustainability between humans, animals and nature is a fine line.

The human and economic costs of displacement are significant which people working in conservation must carefully balance.

# HOW TO RE-LINK CORRIDORS

Source: Wildlife Institute of India

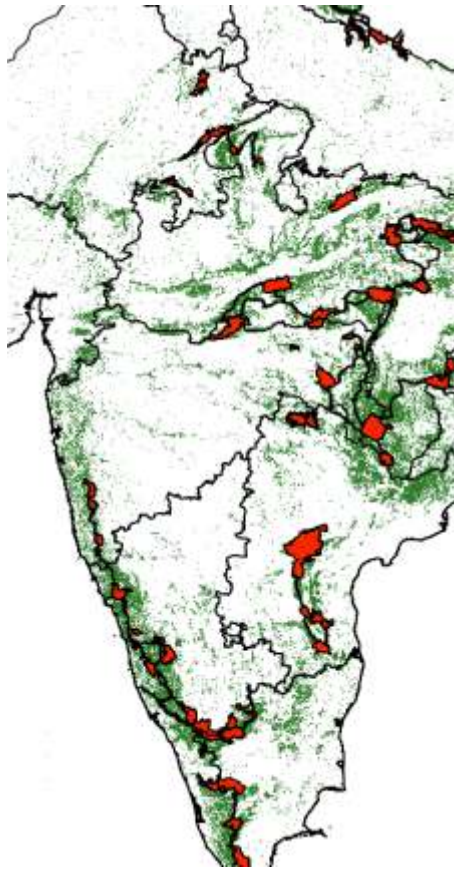
Connected habitat patches that allow for the movement of animals between fragmented areas create “wildlife” corridors. They are vital for wildlife by enabling gene flow, facilitating migration, and supporting access to resources such as food, water, and mating opportunities.

However, human activities such as deforestation, urbanization, and infrastructure development often result in habitat fragmentation, isolating animal populations and restricting their movement. Corridors have been identified by experts to ascertain better survival of wildlife in India. The country has made a large investment in wildlife conservation.

However, to safeguard these investments and for tiger to continue to survive into the long-term future so as to enrich the lives of great-great grandchildren, it is important that these key populations remain connected with each other. These corridors would ensure genetic exchange through dispersal. India is committed to secure the livelihoods of its citizens while simultaneously minimizing its impact on its wildlife conservation goals.

**New tools:** Corridors are conservation interventions like land protection, restoration, and management. When applied to a portion of the potential movement area between habitat patches, it achieves specific connectivity goals in landscapes that would otherwise be fragmented by urban, agricultural, or industrial land uses.

Extant tiger populations are confined to fewer than 7% of their historical range in patchily distributed habitats across a range of twelve regional Tiger Conservation Landscapes (TCLs) in southern and north-eastern Asia. Six global priority TCLs of long-term tiger conservation significance



*Corridors, how to reconnect them...*

are present in the Indian subcontinent alone. These Indian TCLs are important for global tiger recovery as they harbor over 60% of the estimated global population of about 3,000 wild tigers and make for more than 60% of the global genetic variation in the species. The high genetic variation seen in Indian tigers could be attributed to historically high population sizes, numbering about 50,000 individuals until about 200 years ago, and habitat contiguity that permitted genetic exchange between the various regional tiger populations in the area. Due to change in land ownership and forest use policy in the mid nineteenth century during British rule and again during the early years of India's independence a century later, much of the forest was cleared for timber and agricultural needs.

**Fragmentation:** Currently, within the six tiger occupied landscapes of India, habitat contiguity varies extensively. The best is within the

Western Ghats and the Northeast. Fragmentation is highest in the Shivalik-Gangetic Plain and the Central Indian Landscapes, Yumna, etc. Ironically, most of the connecting habitats in these landscapes are not within the legal domain of protected areas and are often lost to burgeoning development demands of a growing economy and attrition by human consumptive uses. Currently in India, the once contiguous tiger population is now fragmented with source populations primarily restricted to tiger reserves.

A tiger reserve is legally mandated to designate a critical core area wherein human habitation and resource extraction is not permitted. This core is surrounded by a buffer zone, which is essentially a multiple use area, wherein conservation objectives are to be given precedence over other land uses. Breeding populations of tigers are mostly located in the core area of tiger reserves, while the buffers usually serve as population sinks.

**Breeding units:** The size of these tiger reserves varies between 344 sq., km 3,150 sq., km (average 1,321 sq., km). The tiger densities range from about 0.1 to 20 individuals per 100 sq. km. For a demographically viable tiger population, a minimum of 20 to 25 breeding units are believed to be essential. As such, many extant tiger populations are of paramount importance.

## HOW MANY?

The National Tiger Conservation Authority in collaboration with the Wildlife Institute of India has published a document titled “Connecting Tiger Populations for Long-term Conservation.” It has mapped out 32 major corridors across the country.

Management interventions for them are operationalized through a Tiger Conservation Plan.

The list of macro/landscape level tiger corridors is at: <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1594508>



# CHANDRAKALA MEMORIAL AWARDS



(left) TWSI Volunteers' Meeting in progress, Sumit Bari,  
(right) TWSI President, Anand Mishra giving away Chandrakala Memorial award to father of a recipient, Sumit Bari

## Conservation Times Editors

Fourteen students of different grades at schools of Jaipur received handsome glass mugs to commemorate Chandrakala Memorial Awards instituted at the 26th Indian Birding Fair held at Jaipur's Man Sagar promenade during February 2023.

The awards were given away by Anand Mishra, President of Tourism & Wildlife Society of India (TWSI) at Wall Street Hotel. He hosted the event at this hotel. The awards are to memorialize the services of this lady volunteer who had been invariably present at the Fairs since the very beginning and passed away during early January 23.

The awards will be an annual celebration of winners. The competition this time received more than 800 participants. The Judges were Govind Yadav and Nishant Nath Shukla, experienced

volunteers for TWSI. They also received the glass mugs in thanks for their services.

## Painting Competition

### Below IX standard

**1st Prize:** Hiyanshi Dhanuka, Sanskar School.

**2nd Prize:** Mansi Sharma.

**2nd Prize:** Nandani Sharma, ChildrenAcademy.

**3rd Prize:** Susmita Das, Shri Agrasen Public School.

**3rd Prize:** Mishima Sharma, Sanskar School.

### Above IX standard

**1st Prize:** Haider Ali, Shri Agrasen Public School.

**2nd Prize:** Jayant Choudhary, Sanskar School.

**2nd Prize:** Chitra Prajapati, MGD Girls School.

**3rd Prize:** Jai Veer Singh Nathawat, Sanskar School.

**3rd Prize:** Pushpendra Das, Shri Agrasen Public School.

## Quiz

**1st Prize:** Pratyush Gupta, Rukmani Birla Modern High School.

**2nd Prize:** Prakhar Sharma, Tagore Public School, Vaishali Nagar,

**2nd Prize:** Sarthak Bhujade, Tagore Public School, Vaishali Nagar.

**3rd Prize:** Aditya Bhandari, Rukmani Birla Modern High School.



The Bird Fair approach, Harsh Vardhan



## PHOTO FEATURE



*Conservation through 'faith', numerous elephants stand over outer wall of Zawar Mata temple, and visitors tie threads over their legs hoping their wishes would be fulfilled.*



*A life-size Tiger at Zawar Mata temple, Zawar. Both photos are offered as a new subject, Photo Feature, obtained by Harsh Vardhan from a tribal area around Zawar, near Udaipur*



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# EDITORS FOR CONSERVATION TIMES



**Anderson, Hartley**

Hartley Anderson is a Sydney, Australia resident who, after more than fifty years in sales and marketing roles, has decided it was time to pursue leisure activities. His recent and new activity which is relevant to conservation is beekeeping. He has a strong interest in India.



**Bhatnagar, Nandita**

Nandita Bhatnagar is a Clinical Biochemist with a passion for writing. Her articles have been published in local newspapers in the Bay Area. She also authors and narrates her stories for a monthly audio magazine "Suhava" published through Rotary Club of Maharashtra for blind school children.



**Bhuvana Ramalingam**

Bhuvana Ramalingam is a nature lover, travel enthusiast, long term meditator, and an Ayurveda wellness consultant living in Houston, Texas. She is the founding Director of Befriend Life Foundation, a non-profit based in Bangalore engaged in providing eco-friendly solutions.



**Goodman, Martin**

Martin Goodman is an award-winning writer and publisher based in the UK. His book *Client Earth* told the tale of eco-lawyers on their global battle to save the planet from environmental collapse. He is Emeritus Professor of Creative Writing at the University of Hull.



**McCrea, Edward**  
Chairman of Editorial Board

Ed McCrea is President of Environmental Education and Conservation Global, a US nonprofit conservation organization. Over the last fifty 50 years, he has worked in environmental education and biodiversity conservation at the local, state, national, and international levels.



**Pandey, Binita**

Binita Pandey is a researcher in entomology with a keen interest in insect taxonomy, behavior, conservation, and plant preference of pests. She has conducted a Bumblebee research project in Nepal. She is the founder and manager of the Nepal Pollinator Network.



**Patil, Amit**

Amit is an eco-lover based in Dallas, Texas. Believing that a traveler always starts out in his backyard, Amit traveled extensively across India. He kept his passion for nature alive after moving to North America and has traveled extensively around the continent.



**Sharma, Manoj**

Manoj Sharma worked for the Indian Statistical Service for 10 years and then immigrated to the USA to pursue graduate studies in statistics. Currently he is the Director of Biostatistics at Grail Inc., supporting the company vision of "Detect cancer early, when it can be cured".



**Sharma, Satish**

Authored 11 books on forest, wildlife management and biodiversity, specialized in ethnobotany and ethnozoology, did PhDs on Plant life of Weaver Birds (1991) and Study of Biodiversity and Ethnobiology of Phulwari WL Sanctuary (2007), former Forest Officer, based at Udaipur.



**Sharma, Seema**

Seema Sharma is an independent journalist based in Chandigarh. She was formerly with the Tribune and the Times of India. She writes on wildlife conservation and environment and is a fellow of CMS-IHCAP fellowship on impact of climate change in Trans Himalayas.



**Thomas, Rosamma**

Rosamma Thomas is a freelance journalist based in Maharashtra, India. She has worked in radio and print journalism. She has only ever lived in cities, despite being a wild creature at heart. She has supported by writing on a unique cause like House Sparrow ex situ breeding initiatives.



**Vardhan, Mamta**  
Co-ordinating Editor

Mamta holds a PhD in Environmental Science and Policy. She has several years of experience working with rural communities in India and East Africa on issues that lie on the intersection of rural livelihoods and natural resources management. Mamta is currently based in Edmonton, Canada where she works as a Research Officer with the provincial Government.

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Conservation Times is on worldwide web, like to click: [www.econservationtimes.com](http://www.econservationtimes.com)