

# **நமது வனம்**

## **NAMATHU VANAM**

(Bilingual Quarterly e-magazine of TASPEF)

**Feb 2025 -Apr 2025**

(For free circulation only)



# NAMATHU VANAM

Feb 2025 -Apr 2025

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**TAMILNADU ASSOCIATION OF SENIOR PROFESSIONALS  
OF ENVIRONMENT AND FORESTS  
(TASPEF)**



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**Issue No : 8**

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**Feb 2025 - Apr 2025**

## **Editorial Board**

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## **Birthday Wishes**

The Editorial team wishes all the members who are celebrating their birthday in the months of February, March and April 2025.

**“A VERY HAPPY BIRTHDAY”**

## **EDITORIAL**

‘India State of Forest Report 2023 (ISFR 2023)’ has been released by the Environment, Forest and Climate Change Department, Government of India on 21st December 2024. The Report provides valuable insights into India’s forest cover, tree cover, mangrove cover, growing stock, carbon stock, Agroforestry and occurrences of forest fires etc. As per this report, the total Forest and Tree cover is 8,27,357sq km, which is 25.17 per cent of the geographical area of our country. The Forest Cover has an area of about 7,15,343sq km (21.76%) and the Tree Cover has an area of about 1,12,014 sq. km (3.41%). India’s forest and tree cover, have shown an increase of 1445.86 Sq. Km in absolute numbers compared to the year 2021. Forest cover in Tamil Nadu is 26450.22 Sq. Km (20.34%) out of which 17734.30 Sq. Km lies in Reserve Forest Area.

Though the statistics is quite impressive ex facie, hopefully the reality on ground is as rosy as the data depicts. Ms. Priyali Prakash and Vasudevan Mukunth, in their article published in Hindu newspaper dated 5th January, 2025, titled “Is India’s forest cover growing enough” quoting extensively from SFR 2023 report, high lights the loss of about 58.22 sq. km of forest cover in the Western Ghats, and about 123.44 sq.km of forest cover between the years 2013 and 2023 in the Nilgiris Biosphere reserve. Further, they state in their publication

quoting SFR, that mangroves area has decreased by 7.43 sq, km from the year 2021 alone.

The issues regarding the Eco Sensitive Area (ESA) prescribed by Gadgil-Kasturirangan report remains a topic of debate, with some saying that the measures are not adequate to protect the environment, while others point out that the ESA implementation in total will harm local livelihoods. The reality is that Forest Ecosystem is facing great threat both from human and climate factors.

We all know, that the healthy forests and landscapes provide goods and services that are critical for people and economies, such as biodiversity habitats, clean water, climate regulation, erosion prevention, crop pollination, soil fertility, and flood control. Yet the debate continues. Forest management faces a lot of challenges upfront which don't allow us to sit pretty on data alone. India, like all other Nations, is poised to leapfrog in economic development aiming to become third largest economy anytime soon. And the history teaches us that development comes at the cost of environment and we are yet to succeed in balancing the same. Sustainable Development goals remain unattained or partially addressed. Mere plantations do not compensate the loss of natural forests.

Real time Forest Management faces mounting problems in Conservation of biodiversity, especially safeguarding Forest Genetic Resource (FGR), in the light of Global warming, which has its immediate impact on Forests. Forest Fires, drying up of water resources due to over exploitation and human interferences are persisting to haunt the Conservation Forestry. Vanishing buffer between habitat and habitations has landed us in perpetual conflict with wildlife leading to mounting stress on frontline staff and driving them to the brink. Paucity of human and financial resources, skills, technology and equipment to deal with current challenges are quite formidable.

We have to re-orient ourselves to the new paradigm, pragmatism and think holistically towards inclusive Forest Policy and Management to integrate Development, Conservation and Eco-service towards a Sustainable Future.

As veteran Foresters, we have a wealth of practical knowledge and we have a moral duty to think forward and discuss the ways and means to help the vital Forestry Sector to serve to the mandate of people's welfare.

I appeal to you to come up with your views and strategies based on your invaluable experience and expertise.

**Warm regards**

**V. Prabhakaran, IFS (Retd),  
Editor,  
Namathu Vanam**

# **ADVANCED INSTITUTE FOR WILDLIFE CONSERVATION, VANDALUR**

## **CENTRE FOR WILDLIFE FORENSIC SCIENCES**

**Thiru. A. Udhayan, I.F.S.,**

**Principal Chief Conservator of Forests & Director**

**Tamil Nadu Forest Department**



***Big congratulations to Tmt K. V. Ganashree, ACF (Karnataka) for topping Module 6: Wildlife Management Tour honoured by PCCF & HoFF, TN. L to R - Dr H. Dileep Kumar, IFS, (DD, AAZP) Thiru A. Udhayan, IFS, PCCF & Director, (AIWC) Thiru Srinivas R Reddy, IFS, PCCF & HoFF, Selvi Mita Banerjee, IFS, PCCF (R&E) Thiru Rakesh Kumar Dogra, IFS, PCCF CWLW, Thiru D. Eswaran, DD (AIWC)***

The Advanced Institute for Wildlife Conservation (Research, Training & Education), (AIWC) an institute of the Tamil Nadu Forest Department was established in October 2017. It was established to function as a centre for wildlife forensics to strengthen wildlife enforcement, provide solutions to wildlife conservation challenges, and train the department personnel in the field of wildlife conservation. The following four Centres are functional to achieve the above objectives: Centre for Wildlife Forensic Sciences, Centre for Animal Care Sciences, Centre for Conservation Education and Centre for Conservation Ecology.

### **1. Centre for Wildlife Forensics**

The Centre for Wildlife Forensic Sciences in AIWC was recently notified as a Government Scientific Expert under section 329 (4) (g) of Bharatiya Nagarik Suraksha Sanhita, 2023 (Central Act 46 of 2023).

The Centre for Wildlife Forensics is presently playing a major role in the wildlife law enforcement in the state. Advanced Laboratories such as **Morphometry Lab, Molecular DNA/Scat DNA Lab** cater to the requirements that stem from the field. The **Morphometry and DNA** laboratories deal with wildlife forensic cases for genuineness analysis, identification of the wildlife article/part, wildlife species identification as well as sex identification. The DNA laboratory is also competent to perform geographical identity and individual identity of species such as elephant, leopard and tiger.

The Centre carries out the analysis of wildlife offence case samples referred to it by various Courts of Justice in Tamil Nadu, Forest/Wildlife Divisions of Tamil Nadu and other states. It has consistently demonstrated its commitment to excellence and capability in wildlife forensic analysis. The Centre for Wildlife Forensic Sciences has a dedicated team of expert scientists and technologists working with advanced facilities to undertake analysis and produce scientific reports as sought by various agencies.

The Centre has conducted research for the enhancement of wildlife forensic protocols, identification of species from a variety of wildlife parts and products for enforcement support, and developing and maintaining a repository of wildlife reference samples. The accuracy and reliability of the analyses have played a pivotal role in supporting the judicial process and enforcing wildlife protection laws. Since 2019 onwards and till 31.12.2024, 189 wildlife case samples have been referred to the Centre for Wildlife Forensic Sciences by the Judicial Courts and the reports have been sent back to the Courts with minimum turnover time. The Centre has also received 193 case samples from the Tamil Nadu Forest Department and 8 samples from other enforcement agencies and the forensic reports are being regularly dispatched.

## Standard techniques and Protocols

The Centre strives to develop standard techniques and protocols in facilitating investigations in wildlife forensic cases and has succeeded in the following:

- a. Development of in-house *trichotaxonomic repository* for species identification (28 flagship wildlife species).
- b. Development of an in-house *genetic repository* for species identification (73 important wildlife species)

## Sample handling procedure

The samples often received in the Centre are tissue, skin, bone, antler, claw, canine, tusk, faeces, and blood from unknown animal species. The Forest Range Officer, Centre for Wildlife Forensic Sciences (CWFS) provides an AIWC unique case ID to the sample and registers the sample

in the Chain of Custody form. Forensic Sample Handling Committee (FSHC) of AIWC decides the type and method of analysis and the samples are transferred to concerned analysts

## Processes in the DNA and SCAT laboratory

Two sophisticated DNA labs have been established in the Centre. In order to avoid contamination issues, one of the labs deals only with DNA analysis of samples obtained from animal scats whereas the other lab deals with DNA from tissues and other body parts. The DNA processes however are common in both the labs and include **DNA extraction, Polymerase Chain reaction (PCR), DNA sequencing and Bioinformatics analysis**.

Apart from the classical processes mentioned above, as part of the Tamil Nadu Innovative Initiatives (TANII) project, the **Centre has developed a High-Resolution Melt (HRM) curve method for the identification of modified, altered and degraded meat derivatives** of deer species. This is important as cooked, semi-cooked or decomposed deer meat is often seized and the species identification from such samples are a challenge with classical methods. The HRM method is a novel method used after PCR amplification, in which a fluorescence-rich region is amplified in double-stranded DNA. A real-time PCR assay with HRM analysis can distinguish nucleic acid samples, based on sequence, length, and Guanine-cytosine content. This technique is based on the pattern of the double-stranded DNA and avoids the DNA sequencing process. AIWC has developed the high-resolution melting (HRM) analysis for deer meat identification (spotted, sambar and barking deer). This method facilitates rapid, cost-effective identification of modified, altered and degraded deer meat.

As part of forensic methods to identify the key chemical ingredients in samples, the Centre has also installed a **Fourier-Transform Infrared spectroscopy facility (FTIR)**. This facility is very useful in distinguishing between **fake and original** wildlife articles and also identifying various body parts like bone, antler, hair etc. The researchers study the physical and analytical properties of samples using spectroscopy techniques to detect, determine, or quantify the sample's molecular and/or structural makeup. The researchers are analysing ivory, claws, nails, hair, canines, antlers, scales, and other wildlife articles using FTIR to prepare the various signature curves and establish the FTIR reference library for selected wildlife articles.

The Advanced Institute for Wildlife Conservation **possesses in-house DNA sequence repository** for 73 species; 16 Aves, 15 Reptiles and 42 Mammals, which aid as reference DNA sequences in case sample analysis. NCBI, National Centre for Biological Information is an open access global database which is widely used as reference. Nevertheless, the limitation of NCBI database in differentiating sub species (like in case of wild and domestic pig) has been overcome by the usage of in-house reference DNA sequences.

## Morphometry Laboratory

The morphometry lab at Advanced Institute for Wildlife Conservation is equipped with facilities to identify the genuineness (original or fake) of seized wildlife part/articles. The lab uses morphological comparison to identify the source of wildlife parts and products to the level of family, genus, or species. Depending on the nature of the evidence, a variety of macroscopic and microscopic comparison techniques are being employed. The **lab can process**

**mammalian hair samples to identify** its originality and ascertain the taxonomical family to which it belongs. The lab is also involved in standardizing protocols for species identification using samples such as bones, antlers, claws, tusks, etc. using a combination of morphometric and analytical methods. The lab is also involved in development of reference repository of wildlife artifacts from the state forest department.



### The techniques adopted by the Morphometry lab

#### i) Tricho taxonomy

Hair is a very stable outgrowth in an animal body whose structure does not putrefy fast and has an excellent scope for morphometric analysis. Tricho-taxonomy is a fast and simple way in identification of mammals and the results can be accurate up to closely related species. Differentiation between species is identified with the help of analysis of cuticle, cortex, and medulla from hair of different species. Species identification based on hair morphology can provide 80% accuracy. Mammalian hair has certain definite and unchanging characters which makes it an important evidence for crime investigation.

#### ii) Elephant ivory identification

Ivory, a commercial product made from the tusks (modified incisor teeth in *proboscidea* order) is highly priced and

one of the most frequent illegally traded wildlife articles in the world. Identification of tusk is done by making a transverse section of the tusk, to visualize the Schreger lines, which is present in genuine elephant tusk. X-ray image of tusk show hollow internal structure of pulp cavity. This is done to establish the authenticity in case of the original tusks and identify fake substitutes of tusks made from animal bones or synthetic material like plastic/gypsum.



### iii) Deer antler identification

Species identification of deer using antlers is done based on the size and shape of the complete antlers. Various skull morphometric parameters and antler morphometric parameters are measured to identify the species of deer. Antler's characters serve as diagnostic characters to identify cervid species. The diagnostic characters are pedicle, main beam, relief, brow, bez, and diameter of the antlers.

### iv) Jackal and fox skull identification

Craniometric as well as radiographic studies are performed for the species identification. Craniometric parameters such as the cranium length, cranium circumference, and nasal length, circumference of orbital cavity, ear length and distance between snout to ear are measured to differentiate between Indian Fox and Golden Jackal



### v) Pangolin scales identification

Indian Pangolin is a large anteater covered by 11-13 rows of scales on the back. A terminal scale is also present on the lower side of the tail of the Indian Pangolin, which is absent in the Chinese Pangolin. Species identification of scales is done by physical characters such as colour, shape and texture as well as morphometric parameters such as scale weight, length and width and number of grooves present in scales.

### vi) Carapace identification

Apart from physical characteristics such as colour, shape and texture of carapace and plastron, few morphometric parameters such as carapace length, width as well as curvature and number of neural and costal plates are considered for species identification.

## **vii) Claw and canine identification**

Genuity of claws and canines are performed by various analyses such as radiography as well as morphometric measurements such as claw and canine length & width and angle measurements of claw apart from physical observation.

## **viii) Porcupine quill identification**

Porcupine quills are identified morphometrically based on the length of different types of quills, banding as well as cross section patterns of different types of quills.

### **Interesting case studies**

Certain challenging case samples handled at the Centre for Wildlife Forensic Sciences are:

#### **a. Elephant tusk and Dung sample**

A single elephant tusk was seized from an accused. The accused claimed that he had picked the fallen tusk from the forest area beside his village. A male elephant with a single tusk was also observed to be in the same forest terrain. In order to ascertain whether the tusk had dropped/broken off from the elephant as it moved along the forest fringe, the staff collected fresh dung samples from the suspected single tusk male elephant and sent the same to CWFS at AIWC along with seized tusk for individual identification.

DNA extraction from the tusk and dung samples were carried out. DNA extraction was also done from the blood sample of elephants from Arignar Anna

Zoological Park (AAZP), Vandalur, & Trichy elephant rescue centre and the tissue sample from Megamalai range elephant, which were used as control for the analysis.

The analysis involved 6 STR loci – specific primers as microsatellite markers. The PCR products of all the samples were subjected to gene scan analysis followed by Fragment Length Analysis using Gene Mapper v6 software.

Microsatellite PCR was successful for 4 (Single Tandem Repeat Polymerase Chain Reaction) STR loci – specific primers showing relatedness thus finally concluding that the tusk seized belonged to the single tusk elephant.

#### **b. Kanjira and a skin sample**

A seized kanjira (musical instrument) and a skin sample were received at CWFS, AIWC for species identification. Morphological parameters such as scale colour and pattern were measured both in kanjira and skin sample and compared with literature for identification. DNA extraction was performed on the processed dermal tissue from the kanjira and the skin sample. Mitochondrial DNA (mtDNA) amplification was carried out using polymerase chain reaction (PCR). Three mitochondrial genes were selected for sequencing, including the cytochrome c oxidase subunit I (COI), cytochrome b (Cyt b), and 16S rRNA genes. The obtained sequences were analyzed for species identification through phylogenetic comparison with reference databases.

Both the analysis concluded that the samples belonged to Bengal monitor lizard.

#### c. Analysis of gut content of predator for prey species

A small piece of skin and few hair samples from the gut content of a predator species were received for analysis. Tricho-taxonomy analysis was done on the hair samples and the tissue sample was analysed in forensic molecular lab. As the sample contained mixed hairs, it was segregated and subjected for analysis. Interestingly two small claw samples were also found in the gut content which was a puzzle to solve as it did not match with any felids or canids. Clue from one of the hairs revealed that it belonged to some rodent, which was then compared with our reference repository.

The claws belonged to a Giant squirrel species. Further, with molecular analysis we discovered that the claw sample was from a Malabar Giant Squirrel. Other hair samples were concluded to belong to leopard and a domestic dog.

So, it was concluded that the predator had consumed a domestic dog and a Malabar giant squirrel as part of its diet.

#### d. Elephant electrocution case solved with suspected burnt skin sample from electric fence.

Tissue from a dead elephant as well as burnt tissue stuck to an electric fence were received for individual

matching. Species identification was conducted through ***mitochondrial DNA (mtDNA)*** sequencing, focusing on the three highly conserved ***mitochondrial loci: cytochrome c oxidase subunit I (COI), cytochrome b (Cyt b), and 16S rRNA genes.***

Genetic markers from the selected mitochondrial genes were used to confirm the species of the sample. Sex determination was achieved by analyzing the sex chromosomes, utilizing the SRY gene for males and the XX marker for females. Individual identification was carried out using microsatellite loci, which allowed for genetic profiling of the sample.

As the sex as well as the individual matched, the analysis confirmed that the sample originated from the same individual, ensuring accurate identification for effective prosecution.

#### Contact Details

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# REMINISCENCES OF A FORESTER

## – SOME SNIPPETS

**Dr. T. Sekar, IFS (Retd),**

**Former Principal Chief Conservator of Forests, Tamil Nadu**

### Prelude

Each of the forester will agree that a career in forestry and wildlife is eventful and ever daring. As custodians of vast and open natural resource, a forester faces many challenges in managing the forest and wildlife wealth under his/her command. I always say before my staff that if District Forest Officers are considered *Kurunila Mannargal* (as they control sizeable expanse of public property), Forest Range Officers are equivalent to *Zamindars*. That is to provide some sense of pride to the field officers. Most of the foresters would have encountered very many mind-boggling events in the discharge of their duty, some of which, turn out to be a learning pivot in their profession. But unfortunately, we seldom record such unique episodes in any form so as to leave some information or idea for other colleagues, juniors or the rank and file. It is always felt in my three decades of service in the State that foresters are good field men but when it comes to scripting the important events and experiences in form of a document, we are a poor lot. In this series, I intend to reminisce on few of the interesting learning experiences, I came across in the State as a forestry professional. Hope, it will be within the objective and mandate of *Namathu Vanam*.

### Woods In the dark

I was in my Range training in Polur Range of Vellore division. It was 1985. The division spanned over 1,84,000 hectare, the largest territorial division in the State. Polur Range alone spread over 33,000 ha

in just five RFs commencing from the foot hills to about 3000' above MSL around Jamunamarathur. That was the humongous size of Ranges and divisions then. Part of the Range fell on the southern outlier of Javadhi Hills and the RFs supported a mix of Southern thorn and, dry deciduous forests. Karnatagiri RF, facing the Polur outskirts was having a good population of hares, wild pigs and spotted deer. Licensed game hunting was still in vogue, with the 1991 amendment to 1972 Wildlife (Protection) Act only bringing a total ban on hunting of wild animals.

There had been discrete information that people of Athimoor village, a hamlet in the fringe of Karnatagiri RF were indulging in illegal shooting of wild animals in the night. On a late winter night, information reached me that some people are venturing into the forest with weapon for hunting. Polur was one of the few Ranges in the State that was provided with the jeep for protecting the abundant sandal wealth present in both the RF and tribal village lands. We set out to Athimoor Forest Check post, parked the jeep behind the staff quarters and began to walk through the bridle path in the forests. After covering nearly 500 meters, we saw some rays of light coming from our opposite side. Quietly observing the spot, we saw the light moving in a direction and it was a search light either hand held or worn around the head. We kept still in dark and heard clearly the voice of people walking in our direction. As the party was intensely searching the area focusing the light for any wild animal movement, light

suddenly flashed on our side. From under the cover of a thicket, I whispered to my Forester to swiftly move with his Guards, watchers and sandal tending watchers in a semicircle fashion so that we can apprehend the prospective poachers. It worked and soon our staff were able to nab two people, one with a search light on his head and a muzzle load gun in his hand. The other person was carrying gunny sack, a butcher knife and ropes. Fortunately, we were able to apprehend them and seized all material evidence before they killed any quarry.

The routine such as ‘on the spot inquest’ was held, arrest made along with seizures. They were brought to the Range Office, their statements recorded, Offence Report under relevant sections of the Tamil Nadu Forest Act, 1882 and Wildlife (Protection) Act, 1972 prepared and the accused taken for judicial remand. We took extra effort to hand over the unlicensed muzzle load gun to the local police station with a request to proceed against the accused under the Arms Act for possessing an illegal arm. As the first Prosecution Witness (PW1), I had travelled to Polur Judicial Magistrate court twice, a few years later to depose in the case. I was informed that the case ended in conviction.

On the lighter side, when I recounted the episode to one of my seniors working in Vellore Circle at that time, he reprimanded me “What a foolish thing you did that night! Light rays in the dark when falling on the animal eyes will get reflected that make their eyes glow and the position of the animal is easily spotted in darkness. What if the poacher mistook you guys in the bush and emptied the barrel!” This sent a chill into my nerves and then on I was trying to be wiser. Much later when I googled, I found that the *tapetum lucidum*, a reflective surface in the eyes of many animals is not present in humans. However, a flash light is bright enough to cause a

reflection off the retina, which appears red because of the blood vessels in the eye.

### **In the service of Wood based Industries**

On completion of my training, I was posted as Assistant Conservator of Forests (Pulpwood), attached to the Office of Conservator of Forests, Ooty Circle, Udhagamandalam. That was my first regular field assignment, though short and brief for eleven months from July 1985 to June 1986. I used to wonder as for what all purposes we were trained at the Indian Forest College, Dehra Dun from Sylviculture to Mensuration, Forest Economics to Forest Management, Forest Survey and Engineering to Wildlife management etc. But here in the field I was merely discharging the function of a tally assistant, just counting and checking the stacks of debarked pulpwood of Eucalypts and Wattle with the stock list prepared by the field staff. The South India Viscose industry at Sirumugai and Tan India Wattle bark unit at Mettupalayam were working in full throttle with the annual pulpwood allotment in the order of over a lakh of tonnes, major chunk of which went from the three forest divisions in the Nilgiris. As and when the debarked wattle and Eucalyptus wood were ready for release to the industry, the Assistant Manager of the industry will come with a jeep to pick me from my office/residence. We travel to the plantation where 10 % of the stacks of different lengths but a uniform height of one metre of pulpwood billets of standard length of one metre used to be checked by me with reference to the list in hand. As per volume-weight conversion, one cubic metre of debarked wood weigh 0.550 tonne and the industry paid to the Forest department at rates per tonne, as approved by Government. This verification becomes a seal of approval for the respective District Forest Officer to order the release of the quantity of pulpwood to the factory. You know at what rush any industry works to

build their raw material inventory. So, at times there will be a need to travel to the far flung plantations in more than a division on the same day. Due to frequent rains in the hill, there was disruption in field work and many days on, I was virtually idling other than attending to some paper work in the office. It was turning monotonous soon for a young forester fresh from training.

My chamber was in the Conservator's office. Conservator of Forests Thiru H. Rajagopal Shetty, IFS though rose from ranks was an astute field officer and was good in mensuration. He had already prepared volume table for babul. He was planning to prepare one for blue gum (*Eucalyptus globulus*). My presence in his office probably sent a signal that here is a young officer whiling away his time and why not use him for a task that will involve day long field activity for months together. His idea was to obtain yield outturn of pulpwood from *Eucalyptus globulus* of varying girth and height so that a volume table can be computed. This involved collection of a huge amount of data in a scientific manner.

As the allotment of plantations to the industry was finalized for the year and the industry was ready to commence the felling, the Conservator ticked the list of plantations from where the field data had to be collected by me. He chose the plantations so as to represent locations of different altitude, slope, rotation number and age. My task is to lay sample plots of 20 x 20 metre at random within a plantation and the number of sample plots would be determined to account for 10 percent of the total area of the plantation. Enumeration of trees, girth at breast height measurement for each tree in the sample plot were recorded prior to felling. As the routine field work of felling proceeded, height of each sample tree felled would be measured, all leaves collected separately, tree billeted to one metre logs and debarked. Weight

and volume of debarked pulpwood, weight of bark, leaves and lops and tops (that would be not fit as pulpwood and is not debarked) are recorded separately for each tree. This involved meticulous collection of enormous data with the assistance of field staff and I was present throughout the day extending till late evening in the field. Conservator used to visit us on and off during this time so that he is convinced that data collection work is progressing as per plan.

By the time, Conservator was satisfied that enough representative data had been gathered for computing a volume table, I ran through the task of collecting all above information from about 200 sample plots in both Nilgiris North and Nilgiris South divisions- all in a record time of seven months. This exercise provided me a sense of accomplishment as I formed part of the team in building a data set for the much-awaited volume table for blue gum species. It also instilled an air of confidence as a professional forester in me. Conservator of Forests during his visit to the field would seek from me the approximate estimated yield of pulpwood per hectare from a particular blue gum plantation. I would scan through the plantation for the approximate tree density, tree girth, tree height, crown dimension etc for a brief while and say that the pulpwood yield from the standing crop will be around so many tonnes per hectare, as per the status of plantation. Later when the plantation was felled and data recorded, my ocular assessment would stand vindicated most of the times. Such was the expertise; I could develop from that field exposure. This tenure also taught me a lesson that no posting in Forest department can be considered non-sensitive or useless and the officer can make meaningful and best use of the time if one only he/she has an aptitude and mind.

- **To be continued next issue.**

# சாதகம் புரியும் சாணவண்டுகள்

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பூச்சியினத்தைச் சேர்ந்த ‘சாணவண்டுகள்’ (Dung beetles) ‘Scarabaeidae’ குடும்பத்தைச் சேர்ந்தவை. இவை வன உயிர்களின் எச்சத்தில் இருக்கும் நுண்சத்து நிறைந்த திரவம் மற்றும் நார்ச்சத்துக்களைத் தாழும் உண்டு, தமது புழுக்களுக்கும் உணவாகக் கொடுக்கின்றன. சாண வண்டுகள் அதன் தலை மற்றும் உணர் கொம்புகளைக் கொண்டு சாணத்தை உருண்டையாகப் பந்தைப் போல் உருட்டும் குணம் மிக்கவை. சில வகை வண்டுகள் உருட்டும் சாணம் ஆப்பிள் பழத்தின் அளவுக்கு இருக்கும். கோடைகாலத்தின் தொடக்கத்தில் இந்த வண்டுகள் சாண உருண்டைகளில் அவற்றை நுழைத்துக் கொண்டு அதனையே உணவாக உண்டு வாழும். பின் பெண் வண்டுகள் சாண உருண்டையில் முட்டை இட்டு, அதிலிருந்து வெளிவரும் புழுக்கள் அந்த சாணத்தையே உண்டு வாழும்.

இப்பொழுதும் கூட மலையடிவார கிராமப்புற வயல்வெளிகளில் வேலை செய்பவர்கள் ஒருவரைக் கிண்டல் செய்யவேண்டுமென்றால், அவரிடம் ‘பழம் வேண்டுமா?’ என்று கேட்பார். அவர் ‘வேண்டும்’ என்றவுடன், ‘மச்சான்! அந்த வண்டுருட்டாம் பழத்தைக் கொண்டு வந்து இவரிடம் கொடு’ என்பார். ‘வண்டுருட்டாம் பழம்’ என்பது ‘வண்டு உருட்டும் பழம்’ என்பதன் மருவிய சொல்லேயாகும். அது வண்டிற்குப் பழமாக (உணவாக) அமையும். ஆனால் மனிதருக்கல்ல. அதன் உண்மை அர்த்தத்தை உணர்ந்தவுடன் பழம் கேட்டவர் பொய்க் கோபம் காட்டுவது சாதாரணமாக நடைபெறும் நிகழ்வாகும்.

சாணவண்டுகள் பொதுவாக உருண்டையாகவும், குட்டையான சிறகுகளையும் கொண்டிருக்கும். 5 முதல் 30 மி. மீ. வரை அளவில் வளர்ந்திருக்கும். வழக்கமாக அவை கருப்பு நிறத்தில் இருந்தாலும், சில வகை வண்டுகள் உலோகத்தைப் போலப் பிரகாசமாக இருக்கும். சில வகை வண்டினங்களில் ஆண் வண்டுகள் அவற்றின் தலைப் பகுதியில் வளைந்த கொம்பு போன்ற அமைப்பைக் கொண்டிருக்கும். இவ்வகை வண்டுகள் அதன் எடையை விட அதிகமான எடையுள்ள உணவை 24 மணி நேரத்தில் உண்டு முடிக்கும்.



ஸ்லங்கன் எச்சத்தில் காணப்படும் சாணவண்டு



சாணவண்மனால் உருண்டையாக உருடப்பட்ட ஸ்லங்கன் எச்சம்

உலக அளவில் சுமார் 7000 வகையான சாணவண்டுகள் இருக்கின்றன. அண்டார்க்டிகா தவிர இதர கண்டங்களில் இவை காணப்படுகின்றன. பொதுவாக இவ்வகை வண்டுகள் வெப்பமண்டலக் காடுகளிலும் புல்வெளிகளிலும் காணப்படுகின்றன. இவை 3 முதல் 5 ஆண்டுகள் வரை உயிர் வாழும்.

ஆப்பிரிக்கக் காடுகளில் 1.5 கிலோ எடையுள்ள யானை லத்தியை ஆயிரக்கணக்கான சாணவண்டுகள் இரண்டு மணி நேரத்தில் உண்டு முடித்துள்ளன. பெரும்பாலான சாணவண்டுகள் தாவர உண்ணிகளின் சாணத்தையே பயன்படுத்துகின்றன. பெண் வண்டு சாண உருண்டையில் ஒரு முட்டையை மட்டம் இடும். அதிலிருந்து உருவாகும் புழு அந்தக் கழிவையே உணவாகக் கொள்ளும்.

சாணவண்டுகள் ‘உருட்டுப்பவை’ (Rollers) ‘வளைதோண்டுப்பவை’ (Tunnellers) மற்றும் ‘வசிப்பவை’ (Dwellers) என்று மூன்று வகைப்படும். உருட்டும் வண்டுகள் சாணம் இருக்கும் இடத்திலிருந்து சாணத்தை உருண்டையாக உருட்டி அதனை வளைக்குள் கொண்டு சேர்த்துவிடும். வளை தோண்டும் வண்டுகள் சாணக் குவியிலின் அருகே தரைக்குக் கீழே வளை தோண்டி சாணத்தைக் கொண்டு அவற்றுக்கான இருப்பிடத்தை உருவாக்கும். ஆண் வண்டுகள் தேவையான சாணத்தை சேகரிப்பதில் ஈடுபடும். உருட்டும் வண்டுகள் அதன் பின்னாங்கால்களையே சாண உருண்டையை உருட்டிக்கொண்டு செல்லப் பயன்படுத்துகின்றன. பெண் வண்டுகளே சாணத்தை வகைப் படுத்துகின்றன. வளைகளில் வசிக்கும் பெண் வண்டுகளே சாணத்தால் ஆன இருப்பிடத்தில் இனவிருத்தி செய்து இளம் வண்டுகளைப் பாதுகாத்து வளர்க்கின்றன. இவ்வகை வண்டுகள் 3 ஆண்டுகள் வரை உயிர் வாழும்.

சில வகை வண்டுகள் பிற வண்டுகள் சேரம் செய்த சாணத்தைத் திருடி உண்பதோடு, அவற்றின் முட்டைகளையும் கூடத் தின்றுவிடும்.

ஆஸ்திரேலியா 45 வகையான சாண வண்டுகளை உலகின் பல்வேறு பகுதிகளிலிருந்தும் இறக்குமதி செய்து அங்கே குவிந்துகிடக்கும் மாட்டுச் சாணத்திலிருந்து விடுதலை பெற்றது.

பண்டைய எகிப்தில் காணப்படும் ஓவியங்கள் மற்றும் ஆபரணங்களில் வரையப்பட்டிருக்கும் வண்டுகள் இந்த சாண வண்டுகளோயாகும். இந்த வண்டு உருட்டும் சாண உருண்டையினைப் பூமியாகவும், இந்த வண்டினை சூரியனாகவும் எகிப்தியர்கள் கருதினார்கள். இந்தியாவில் உள்ள இவ்வகை வண்டுகள் மிகப் பெரிய சாண உருண்டைகளை உருட்டி அவற்றின் மீது களிமண்ணைக் கொண்டு மூடிவிட, காய்ந்த பிறகு அந்த உருண்டைகள் மிகவும் கடினமாகத் தோன்றியதால் அவற்றைப் பழைய கல்லாலான பீரங்கிக் குண்டுகள் என்றே நினைத்துள்ளனர்.

ஒருவேளை சாணவண்டுகள் இல்லையென்றால், பூமியின் மீது வெறும் சாணக் குவியலே எங்கும் காணப்படும். ஏனெனில் ஒரு நாளில் சுமார் ஒரு லட்சம் டன் எடையுள்ள விலங்கின எச்சங்களைச் சாண வண்டுகள் பூமிக்கு அடியில் புதைப்பதன் மூலம் அவற்றை உரமாக மாற்றித் தாவரங்களுக்கு உணவாக வழங்கும் மிகப் பெரிய சேவையை ஆற்றுகின்றன. இப்படி சூழியல் மேம்பாட்டிற்கு இவை செய்யும் சேவை பலருக்கும் தெரியாமலேயே போய்விடுகின்றது. ஆகவே இயற்கையில் நிலவுகின்ற உணவுச் சங்கிலியில் ஒர் முக்கிய அங்கமாகத் திகழ்ப்பவை இந்தச் சாண வண்டுகள் என்பதை நாம் அனைவரும் உணரவேண்டும்.

இப்படி விலங்குகளின் எச்சத்தை வேறு இடங்களுக்குக் கொண்டு சென்று, அவற்றை உணவாகச் சிதைத்து உண்பதன் மூலம் ஓட்டுண்ணிகளைக் கட்டுப்படுத்துதல், விதை பரவத் துணை செய்தல் மற்றும் சத்து சுழற்சி ஆகிய சூழியல் தொடர்பான செயல்பாடுகளுக்குத் துணை செய்வதன் வாயிலாக பூமியில் வாழும் அனைத்து உயிரினங்களுக்கும் சாணவண்டுகள் சாதகம் புரிந்து வருகின்றன.

சாண வண்டுகளின் பயன்களை நன்கு அறிந்த ஆங்கிலேயர்கள் வண்டன் உயிரியல் பூங்காவில் அதற்கான ஒரு சிலையை உருவாக்கி இருக்கின்றார்கள் என்றால் அதன் பெருமையினை என்னென்று சொல்வது!



**வண்டன் உயிரியல் பூங்காவில் அமைக்கப்பட்டுள்ள சாண வண்டுகளின் சிலை**

சாணவண்டுகள் உலகிலேயே பலம் பொருந்திய வண்டுகளாகும். அவை அவற்றின் எடையைப் போல் 50 மடங்கு எடையுள்ள விலங்கின் சாணத்தை நகர்த்தும் திறன் கொண்டவை. ஒரு மணி நேரத்தில் சுமார் 750 மீ, அதாவது முக்கால் கி.மீ தூரம் சாண உருண்டைகளை உருட்டிச் செல்லும் திறன் மிக்கவை. இவற்றின் தொல்படிவங்கள் சுமார் 30 மில்லியன் ஆண்டுகளுக்கு முற்பட்டு இருப்பதால், தற்போது காணப்படும் இவ்வகை வண்டுகள் தற்காலத்திய புதுமாதிரியான வண்டுகளாக இருக்கின்றன.

தென் ஆப்பிரிக்காவில் உள்ள பாதுகாக்கப்பட்ட பகுதிகளில் சாண வண்டுகள் வாழும் இடங்களில் வாகனம் ஓட்டுப்பவர்கள் சாண வண்டுகளோ அல்லது யானைகளின் லத்தியோ இருந்தால் அவற்றின் மீது சக்கரத்தை ஏற்றாமல் ஓட்டவேண்டும் என்று எச்சரிக்கைப் பலகைகள் வைக்கப்பட்டிருள்ளன. அந்த அளவுக்கு அங்கே சாண வண்டுகளுக்கு முக்கியத்துவம் கொடுக்கப்பட்டு வருகின்றது.



### **கீழ்க்கோதையார் வன ஓய்வுவிடுதி அருகே காணப்படும் சாணவன்டு**

வண்டு யானை லத்தியில் மட்டுமே இனவிருத்தி செய்யக்கூடியவை. இவை கீழ்க்கோதையார் வன ஓய்வுவிடுதி அருகே அடிக்கடி காணப்படும். *Onthophagus pectolus* வண்டு, சாதாரணமாக எல்லா இடத்திலும் காணப்படக்கூடியது. மேற்குத் தொடர்ச்சி மலையில் அமைந்துள்ள சோலைக் காடுகளில் இறக்கையில்லாத ஒரு வகையான சாண வண்டுகள் காணப்படுகின்றன.

சாண வண்டுகள் விலங்குகளின் எச்சத்தை உருண்டையாக உருட்டி அதனைப் பின்னங்கால்களால் விரைவாக நகர்த்துக் கொண்டு செல்வது, பார்ப்பதற்கே விநோதமாக இருக்கும். சிலசமயங்களில் இரண்டு வண்டுகள் சேர்ந்து சாண உருண்டையை உருட்டிச் செல்வதும் உண்டு.

இப்படி சாண வண்டுகள் விலங்கினங்களின் எச்சத்தை உணவாகக் கொள்வதோடு, அதைச் சிதைத்து கரிம மற்றும் கனிமப் பொருட்களாக மாற்றி, அப்பொருட்களை மீண்டும் பிற உயிரிகள் பயன்படுத்துவதற்கான வழி வகைகளை உருவாக்கித் தருகின்றன. ஒருவேளை இத்தகைய செயல்பாட்டினைச் செய்வதற்கு இது போன்ற சாண வண்டுகள் இல்லையென்றால், விலங்கினங்களின் கழிவுகளில் உள்ள சுத்துக்கள் அனைத்தும் பிற உயிரினங்களுக்குக் கிடைக்காமலேயே போய்விடும்.

‘உற்பத்தியாளர்கள்’(Producers), ‘உண்பவர்கள்’(Consumers) மற்றும் ‘சிதைவுண்ணிகள்’(Decomposers or Detrivores) என்று மூன்று தொகுதிகளாக இயற்கையில் காணப்படும் உயிர்க்காரணிகளுள் இவ்விதம் சிதைவுண்ணிகளாகச் செயல்படும் புழுக்கள், பூச்சிகள், நுண்ணுயிர்கள் மற்றும் பூஞ்சைகள் ஆகியவற்றுள் சாண வண்டுகளின் குழியல் சேவைகளை உணர்ந்து அவைகளைப் பாதுகாப்பது நமது இன்றியமையாத கடமையாகும்.



# MIYAWAKI FORESTS – HOPE OR HYPE

V. Prabhakaran IFS (Retd)

Former Additional Principal Chief Conservator of Forest



*Dr. Akira Miyawaki*

## GENESIS

Miyawaki forests may be a global sensation, but not everyone is for its adoption. This method developed by the Japanese ecologist, Akira Miyawaki, in the early 1970s for Nippon Steel, has been adopted by various Japanese corporations and was initially implemented in Japan. Later, Miyawaki collaborated with these Japanese multinational companies and promoted this method in other parts of the world. This success led Miyawaki in 1999 to lay claim that “quasi-natural forests can

be built in 15-20 years in Japan and 40-50 years in Southeast Asia.”

Akira Miyawaki, a native of Okayama prefecture, Japan was born in the year 1928. Impressed with his work on weeds, the German botanist Reinhold Tuxen invited Miyawaki to study in Germany from 1958. It was Tuxen, who introduced Miyawaki to his theory of “potential natural vegetation,” *“that is the native vegetation that can be supported by the ability of the given area”*. In other words, the vegetation that existed before human intervention. This

theory is the cornerstone of the Miyawaki method of afforestation. The “Miyawaki” is an afforestation technique for cultivating fast-growing groves of native plants, with the dense, mixed planting intended to simulate the layers of natural forests. The popularity of Miyawaki forests has skyrocketed in India and elsewhere. Many Indian ecologists and foresters are sceptical on this method’s applicability to India’s diverse ecological environments. However it should be noted that Miyawaki method is not a standard Forestry Practice adopted by Forest Department.

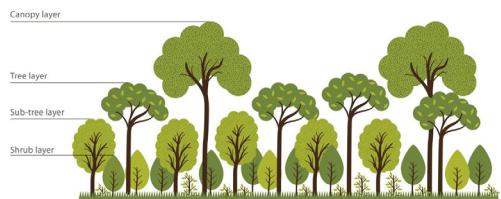
## An Insight into Miyawaki Method

Let us have an overview of this method as originally contemplated by Dr.Miyawaki.

## Background

Japan was rapidly developing in the 1950s and '60s, with, at first, little thought for the environment. “Forests and Satoyama”- woods used for small-scale agriculture and forestry, were rapidly cleared to make way for residential areas, with the result air and water pollution was very severe. The Industrial pollution was causing serious illness such as Minamata disease and Yokkaichi asthma. This forced the Japanese Government to establish the Department of Environment in 1971 to address these issues.

On return to Japan in the year 1960, finding almost no “potential natural vegetation” due to centuries of human intervention, Miyawaki, still inspired by Tuxen, devoted himself to cataloguing his country’s native plants using the protected forests around Shinto shrines as key reference points. It was these surveys which attracted polluting industries in Japan, to Miyawaki, to solve the issue of pollution and danger to public health through plantations. His breakthrough came when in 1971 when the Japanese Steel industry giant, Nippon Steel’s newly formed environmental division engaged the services of Miyawaki to create forests at the company’s production sites, and Miyawaki Forests went global.



*Source: [www.orchardofflavours.com](http://www.orchardofflavours.com)*

## Key Characteristics Miyawaki’s method

1. Dense Planting: Multiple native species are planted close together to mimic the natural forest ecosystem.
2. Native Species: Only native plant species are used to promote biodiversity and ecosystem services.
3. Minimal Maintenance: The forest is designed to be self-sustaining,

- with minimal human intervention required.
4. Fast growing: The Miyawaki method uses a specific planting technique that encourages rapid growth, often achieving canopy closure in a short time

### Benefits:

1. Biodiversity Conservation: Miyawaki Forests promote native species conservation and biodiversity.
2. Urban Heat Mitigation: The forests help reduce urban temperatures and improve air quality.
3. Soil Erosion Prevention: Tree roots hold soil in place, preventing erosion and landslides.

4. Climate Change Mitigation: Miyawaki Forests sequester carbon dioxide and produce oxygen.
5. Community Engagement: The forests often serve as community spaces, promoting aesthetics and environmental awareness.

In a nutshell Miyawaki's method involves, selecting plant species native to the given planting site; improving the soil by mixing in organic material; plant seedlings of native trees and understory plants in a dense, mixed manner (about three seedlings per square meter) meant to simulate a natural forest; remove weeds from the site for up to three years after planting, depending on weed growth. After three years of maintenances, the grove is left without any intervention. Due to the dense planting, the seedlings grow quickly as they compete for sunlight, in the process known as "Etiolation".



*A Miyawaki mini-forest planted in 2007 at Izumo Taisha Sagami Bunshi in Kanagawa prefecture. (Image by Annelise Giseburt for Mongabay)*

In 1991, University Putra Malaysia (UPM) planted 300,000 seedlings under Miyawaki's direction in 50 hectares of land at its campus in Bintulu, Sarawak State, which was a logging town. With further annual plantings the site is said to contain 126 species of native vegetation. A Malaysian environmental non-profit organisation, "Friends of the Earth" published a paper in 1993 criticising the Miyawaki project in Bintulu, arguing that "Malaysia's natural forests are being depleted by Mitsubishi's subcontractors at rates faster than any reforestation can take place". According to that paper, Japan imported 6.7 million cubic meters (237 million cubic feet) of logs from Sarawak in 1989 and cited Sarawak Forest Department statistics that roughly 3 million hectares

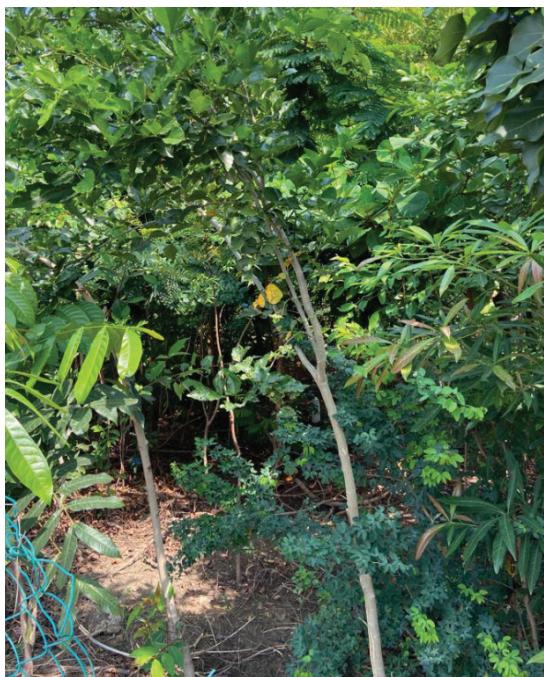
(7.4 million acres) of primary forest had been logged (including by other actors) by that year. Was Miyawaki Afforestation method a pretext for natural forests exploitation?

In India, "Afforestt" a foundation and a "service provider for creating natural, wild, maintenance free, native forests" using the Miyawaki method, has planted 450,026 trees in 44 cities across 10 countries, according to the company's website. (<https://www.afforestt.com/>) The founder of this "Afforestt", Mr Shubhendu Sharma, was an ex-employee of a Toyota plant in India. He was influenced by Mr. Miyawaki whom he had met in 2009 to form this foundation.

## Critique

However, the Miyawaki method's popularity in India isn't universal. In April 2023, Indian ecological gardeners Fazal Rashid and Somil Daga, (fazalrashid@gmail.com and somildaga@gmail.com) published a paper in "The Wire" in April 2023. (<https://science.thewire.in/author/fazal-rashid-and-somil-daga>). They highlighted in their paper that the Miyawaki method often ignores ecological niches, incur unnecessarily high costs, and are an "easy way to make money" via corporate CSR budgets.

Current Practices noticed in Chennai area are that tall seedlings of various tree



*Miyawaki forest planted in Velachery - Perungudi Road*

species, as are available on the date of planting, are planted in close espacement. Sometimes even less than 50 Centimetres. As foresters, we know that while planting, we shouldn't just plant anything anywhere. Each plant / tree species has their own specific needs. This is widely ignored in practice, at the peril of local ecology.

## Conclusion

However, the advantages of the Miyawaki Forests are their ability to promote fast and dense growth of planted flora. By densely planting a variety of native species in a small area, the technique encourages competition among plants, leading to accelerated growth rates compared to traditional reforestation methods. By prioritizing the use of native plant species helps to restore local floral and faunal biodiversity at a faster rate and contribute in, increased rate of carbon sequestration and reduces the impact on climate change. Since this concept has caught the imagination of the local community and brought in their wholehearted participation, the expansion of Miyawaki forests in newer areas is gaining momentum. This momentum should be used to afforest as much open area as possible, with proper guidance and suitable native species mix.

However, there are some issues like higher requirement for labour, planting and

accessory materials, logistics, increased carbon foot-print due to higher use of fossil fuel for raising nurseries, transport and the initial few years of maintenance and higher financial outlay required are the challenges that are a concern. Ecological disruption due to introduction of non-native species needs to be addressed. In conclusion, the advantages outweigh the disadvantages, if executed with some judicious care and scientific guidance. Even if Miyawaki Method is not a Standard Forest Practice its efectiness in Greening the landscape should not be lost sight of. There are several advantages in creating a dense woodlot in the present Global Warming days.

*"Miyawaki method or whatever method — go ahead. Plant that forest. Don't destroy our forests, because the forest takes care of the air, the water, the animals, everything. Our security depends on the forest."* - Dr.Nik Muhamad Majid, a retired professor at Putra Malaysia University (UPM).

Should we not agree with Dr Nik?



# ENDEMIC BIRDS OF WESTERN GHATS

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Western Ghat mountains that stretches along the six states of Gujarat, Goa, Maharashtra, Karnataka, Kerala and Tamil Nadu, are considered as older than Himalayas. They have a great influence on the weather pattern and monsoon. Western Ghats have exceptionally high level of biological diversity, endemism and recognised as one of the eight “hotspots”

of bio-diversity. These mountains cover an area of 140,000 sq.km over a length of 1600 km (interrupted by a 30 km wide Palakkad Gap in Kerala). The Western Ghats lie parallel to the west coast of India and contains some of the best representative, non-equatorial tropical evergreen forests in the world.



*Shola forests of Western Ghats*



*Lingmala waterfall in Western Ghats of Pune, Maharashtra*



*Rolling grass hills in Kanyakumari, Tamil Nadu*

At least 325 globally threatened (IUCN Red Data List) floral and faunal species occur in the Western Ghats. The globally threatened flora and fauna in the Western Ghats are represented by 229 plant species, 31 mammal species, 15 bird species, 43 amphibian species, 5 reptile species and 1 fish species. Of the total 325 globally threatened species in the Western Ghats, 129 are classified as Vulnerable, 145 as Endangered and 51 as Critically Endangered.

To qualify as a biodiversity hotspot, a region must **meet two strict criteria**:

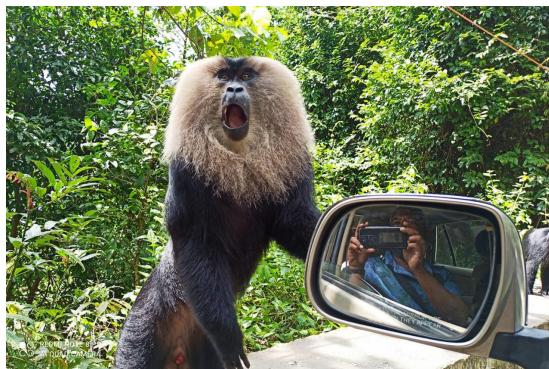
- It must have **at least 1,500 vascular plants as endemics** — which is to say, it must have a high percentage of plant life found nowhere else on the planet. A hotspot, in other words, is **irreplaceable**.
- It must have **30% or less of its original natural vegetation**. In other words, it must be threatened.



*Nilgiri Tahr, an endemic and endangered species of Western Ghats in Anamalai, Tamil Nadu*

Around the world, **36 areas** qualify as hotspots. Their intact habitats represent just **2.5% of Earth's land surface**, but they support more than half of the world's plant species as endemics — i.e., species found no place else — and **nearly 43% of bird, mammal, reptile and amphibian** species as endemics.

The Western Ghats has around 1,700 endemic plant species out of the 5,000 vascular plant species in the region. This includes 352 endemic tree species out of the nearly 650 tree species in the Western Ghats. Due to the enormous potential as hotspot, UNESCO has declared Western Ghats as World Heritage site in 2012. At least 325 globally threatened species occur in the Western Ghats.



*Lion-tailed Macaque, an endangered species endemic to western ghats, near Agumbe, Karnataka*

Earlier sources indicated about four to five thousand vascular plant species of which nearly one-third was endemic to the region. Later studies and publications have recorded 7,402 species of flowering plants occurring in the Western Ghats of which 5,588 were described as indigenous, 376 are naturalized exotics, and 1,438 species are cultivated or planted. Among the indigenous species, 2,253 species are endemic to India and of them, 1,273 species are exclusively confined to the Western Ghats. 645 tree species were recorded with a high endemic ratio of 56%. There are 850 to 1,000 species of bryophytes, including 682 species of mosses (28% endemic) and 280 species of liverworts (43% endemic), 277 species of pteridophytes and 949 species of lichens (26.7% endemic).

One aspect of biodiversity that received considerable attention are the birds. Birds act as an indicator of biodiversity as they are mobile and responded to climate change. Here in this article, I have listed, the 29 bird species endemic to Western Ghats. There are about 500 species of birds recorded in the whole Western Ghats region out of which following 29 species are endemic.

**STATUS OF WESTERN GHATS ENDEMIC BIRDS**

<b>Sl.no</b>	<b>COMMON NAME</b>	<b>STATUS</b>
1	Ashambu Laughingthrush	Vu
2	Banasura Laughingthrush	En
3	Black and Orange Flycatcher	Lc
4	Broad-tailed Grassbird	Vu
5	Crimson backed Sunbird	Lc
6	Flame throated Bulbul	Lc
7	Grey-fronted Green Pigeon	Lc
8	Grey headed Bulbul	NT
9	Malabar Barbet	Lc
10	Malabar Grey Hornbill	Vu
11	Malabar Lark	Lc
12	Malabar Parakeet	Lc
13	Malabar Starling	Lc
14	Malabar Woodshrike	Lc
15	Nilgiri Flowerpecker	Lc
16	Nilgiri Flycatcher	Lc
17	Nilgiri Laughingthrush	En
18	Nilgiri Pipit	Vu
19	Nilgiri Sholakili	En
20	Nilgiri Thrush	Lc
21	Nilgiri Woodpigeon	Vu
22	Palani Laughingthrush	NT
23	Rufous Babbler	Lc
24	Vigors's Sunbird	Lc
25	White-bellied Blue Flycatcher	Lc
26	White-bellied Sholakili	Vu
27	White-bellied Treepie	Lc
28	White-cheeked Barbet	Lc
29	Wayanad Layghingthrush	Lc

En-Endangered, NT- Near Threatened, Vu-Vulnerable,

Lc -- Least concerned

Nearly forty percent of the endemic birds are in danger mainly due to deforestation and habitat loss. As per the latest “State of the Indian Birds 2023” (SoIB) report six, of the twenty species are endemic to western Ghats, requiring highest conservation priority. Some of the endemics like White cheeked Barbet and Nilgiri wood Pigeon have extended their presence far away from the Western Ghats. White cheeked Barbet is very common in Bangalore urban and Nilgiri wood Pigeon is seen in Nandi hills which is about 50km away from Bangalore with an altitude of 1479 met MSL



### ***Beauty of the Western Ghats: Black and Orange Flycatcher (Endemic)***

According SoIB 2023, birds that are endemic to Western Ghat hotspot have rapidly declined over the past few decades. The reasons behind this decline are not clear. Some possibility may include de-forestation, reduction in food resources such as insects within the rainforests and perturbations in weather and phenology induced by climate

change. We must diagnose the problem by investigating these and other possibilities, in order to take directed steps to strengthen ongoing conservation efforts.



***Malabar Gray Hornbill (Endemic and Vulnerable)***

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# WHICH IS MORE PRECIOUS?

## SNAKE VENOM or GOLD

**Dr. S. David Raj, MBA, PhD., BL,**  
**Assistant Conservator of Forests (Retd)**



*Rescuing a Cobra*

**1 gm Gold – Rs 7,000**  
**1 gm Cobra Venom – Rs 25,000**  
**1 gm Russell Viper Venom – Rs 30,000**  
**1 gm Common Krait Venom – Rs 35, 000**  
**1 gm Saw-scaled Viper Venom – Rs 45,000**  
**(all fig approx.)**

Now you decide which is more important. In 1972, The Government of India enacted the Wildlife Protection Act with the aim of safeguarding the

country's wildlife. The primary objective of this legislation is to prevent poaching, smuggling, and the illegal trade of animals and their products. *Harming snakes*, including activities like hunting, killing, or capturing them, is considered a serious offense *leading to fines and imprisonment for up to 3 years. under the provision of WLP Act 1972*

Snakes are a special and varied group of reptiles that belong to the suborder Serpentes. Found across the globe, from the arid deserts to the lush rainforests, dry grasslands, and even in aquatic environments, they are some of the most fascinating species of the animal kingdom. There are 3,000 species of snakes, each having a wide range of shapes, sizes, and colors. Some species are incredibly small, while others, like the reticulated python, can grow to astounding lengths, reaching up to 30 feet. Snakes are legless creatures, which make them distinct from most other animals, and they have evolved unique ways of moving by slithering. They use their muscles and specialized scales to slide over surfaces, whether it's crawling through the grass, burrowing underground, or climbing trees.

One of the remarkable features of snakes is their ability to consume prey much larger than their head. This is made possible by their highly flexible jaws, which can stretch and expand to encircle their meal. Snakes primarily feed on small animals such as rodents, frogs, lizards, birds, and even larger creatures like deer and pigs, depending on the species. Their feeding habits play an important role in maintaining a healthy balance within ecosystems.

Snakes also perform vital ecological functions. As predators, they regulate populations of smaller animals, especially rodents, which can be pests that damage crops and spread diseases like Hantavirus and Lyme disease. By keeping these populations in check, snakes contribute to the overall health of ecosystems. Additionally, certain species assist with seed dispersal, promoting plant diversity.

There are two primary categories of snakes: venomous and non-venomous. Venomous snakes, such as cobras, vipers, and rattlesnakes, possess specialized glands that produce venom. This venom is used to immobilize or kill their prey, making it easier for the snake to consume. While venomous snakes are often feared due to their potential danger to humans, it is essential to note that most snakes are not venomous and do not pose a threat unless provoked. Non-venomous snakes, like the common garter snake or boa constrictors, rely on constriction to subdue their prey. They wrap around their victim and squeeze tightly until the animal is immobilized.

Although many snakes have a fearsome reputation, they generally avoid humans. Most snakes are timid creatures, preferring to remain hidden or flee rather than confront threats. However, understanding their behavior and respecting their role in nature is essential. Snakes help keep

pest populations under control, benefiting agriculture by reducing the need for pesticides and promoting a healthier environment.

## Snakes in the World

Snakes are found in nearly every part of the world, with species adapted to various environments. From the venomous cobra that reigns in the forests of Southeast Asia to the constricting pythons of the African savannas, snakes exhibit fascinating diversity in their behaviors and adaptations. Venomous species, such as vipers, cobras, and rattlesnakes, rely on their venom to capture or kill prey. This venom not only aids in the hunting process but also serves as a defense mechanism against larger predators.



### Snake Awareness Program

Venom is a complex mixture of proteins and enzymes that can quickly paralyze or kill prey, making it easier for the snake to consume it. The venom of certain species has medical applications, particularly in the development of anti-venoms that save lives when a venomous snake bites a human. In addition to anti-venoms, snake

venom is being studied for its potential to treat various health conditions, including heart disease, blood clots, and even cancer.

Non-venomous snakes, such as boas, pythons, and garter snakes, rely on constriction to subdue their prey. Constrictors wrap around their prey and squeeze until the animal suffocates. These species, while lacking venom, have evolved other ways to effectively capture and consume food. Their ability to swallow large prey whole, aided by their highly flexible jaws, allows them to target a wider range of animals.

Snakes also have specialized sensory adaptations. For instance, they can detect heat using specialized pits on their faces, allowing them to “see” in the dark or track warm-blooded prey. Their forked tongues help them “taste” the air, picking up chemical signals and scents, which provide vital information about their environment.

Ecologically, snakes play a critical role as both predators and prey. They help regulate populations of smaller animals, especially rodents that might otherwise overrun ecosystems. By controlling rodent populations, snakes help prevent the spread of zoonotic diseases like Lyme disease and Hantavirus, which are often carried by these pests. Furthermore, snakes themselves serve as food for larger

predators, such as birds of prey, foxes, wild cats and king cobras, creating an essential link in the food chain.

## Snakes in India

India, with its vast range of ecosystems, is home to over 270 species of snakes. These species vary greatly in size, appearance, and behavior. Some of the most well-known venomous snakes in India include the Indian cobra, King cobra, the common krait, and the Russell's viper. These snakes can pose significant threats to humans due to their venom, but they generally avoid contact unless provoked. In contrast, non-venomous snakes play crucial ecological balance.

Indian snakes are also known for their bright, colorful skins and unique patterns, which help them, blend into their environments. For instance, the Indian green tree snake uses its green color to camouflage among the leaves and branches of trees, while the brightly colored coral snake uses its striking appearance as a warning to potential predators that it is venomous.

Snakes in India also have cultural and spiritual significance. In Hindu mythology, snakes are often associated with deities and are symbols of power, fertility, and protection. Festivals like Naga Panchami, where people worship and offer prayers to snakes, highlight the deep reverence that

many communities have for these species. This cultural connection fosters a greater appreciation for snakes and encourages conservation efforts.



### ***Behavioral Studies***

## Snakes in Tamil Nadu

Tamil Nadu, a state in southern India, is home to a rich diversity of snake species, including both venomous and non-venomous types. The state's varied landscapes, which include forests, wetlands, grasslands, and coastal areas, provide ideal habitats for snakes. Among the venomous species are the spectacled cobra and the saw-scaled viper, both of which can be dangerous to humans, especially in rural areas where human-snake interactions are more common.

Tamil Nadu's snakes exhibit a range of behavioral and ecological adaptations that enable them to thrive in diverse environments. Some, like the common rat snake, prefer terrestrial habitats and are often found in fields or near human settlements. Others, like the Indian

water snake, have adapted to aquatic environments and are found in rivers, lakes, and marshes. The adaptability of these species to different ecosystems is crucial for their survival and success.

## Conclusion

Snakes play an indispensable role in maintaining ecological balance. By controlling the populations of rodents and other small animals, they prevent the spread of diseases and protect crops. Beyond their ecological roles, snakes are also valuable to human health. The study

of snake venom has led to the development of life-saving antivenoms. By recognizing the importance of snakes and respecting their place in the natural world, we can foster a better understanding of how interconnected life on Earth is. Snakes, despite their reputation, are essential species, that help to preserve the balance of nature by controlling pests and promote agriculture, and provide vital medicine. Understanding and conserving snakes ensures that both the natural world and human communities can thrive together.



## TN SEES DROP IN OLIVE RIDLEY NESTS

*Only 343 Nests, Lowest Recorded: Wildlife Authorities, Conservationists worried*



Chennai: For the first time in 25 years, Tamil Nadu has recorded a sharp decline in Olive Ridley sea turtle nests along its coast, raising concerns among wildlife authorities and conservationists. Only 343 nests were identified across the state, the lowest in recorded history. Officials attribute the decline to human-induced threats, which are increasingly jeopardising turtle survival.

Wildlife officials report that more than 1,000 dead Olive Ridleys washed ashore on the Chennai coast alone, significantly affecting nest sightings and egg collection efforts. Along the Chennai coastline, stretching from Pulicat to Kovalam, only 31 nests were recorded, yielding 2,778 eggs since the nesting season began on Jan 1.

One of the major threats is from large deep-sea fishing nets, some weighing up to 10 tonnes, that entangle turtles leading to fatalities. The unchecked

use of squid nets poses another serious hazard. Despite regulations, the fisheries department failed to monitor violations effectively, leading to an increase in turtle deaths along the Chennai coast.

The fisheries department attributed this to fishermen from Cuddalore, saying they frequently deploy these harmful nets. However, conservationists argue that such finger-pointing does little to implement effective solutions and address the underlying problem.

Chennai Wildlife Warden Manish Meena said his team and the fisheries department conducted a patrol from Kasimedu to Tiruvanmiyur and found 24 trawlers fishing within the restricted five nautical miles of the shore. Notices were issued to all violators for penal action, he said.

Experts stress the urgent need for proactive measures to protect nesting habitats and reduce human-induced risks. Stricter enforcement of regulations and better awareness among the fishing community is essential. They warn that without coordinated efforts, the survival of Olive Ridley turtles—critical to the marine ecosystem—will remain in jeopardy.

Courtesy: The Times of India dated 27.01.2025

# **REMINISCENCES OF BIRD-BANDING IN KANYAKUMARI WILDLIFE SANCTUARY**

**V. Sundararaju. IFS,**

**Former Deputy Conservator of Forests (Retd)**

It was planned to organize a two-day training program on identification of aquatic birds and bird banding in Kanyakumari Forest Division for the field staff during my tenure in the Kanyakumari Forest Division. The field staff are being trained in identification of aquatic birds in recent years only, since census is being conducted annually and there was every possibility of getting a Conservation Reserve in this district. Under these circumstances it was decided to have training for the field staff with the help of the Scientists of Bombay Natural Dr. S. Balachandran of BNHS who was stationed at Point Calimere and doing research on birds was contacted and requested to conduct a training program for two days for the field staff. He was happy to receive my invitation and readily agreed to come over to Kanyakumari with his team members and necessary accessories. The dates were finalized and fixed on 23<sup>rd</sup> and 24<sup>th</sup> of September, 2010.

On 22<sup>nd</sup> September 2010, itself Dr. S. Balachandran and his team members came over to Nagercoil. As planned, all the Forest Range Officers (FROs) were present

with their field staff the next day at 6 am at the District Forest Officer's (DFO) Office Campus. Nearly 60 field staff present were divided into 6 groups and provided with books on birds and binoculars for watching the birds. In addition to Salim Ali's book "*The book of Indian Birds*", the staff were provided with "*BNHS Field guide on South Indian birds*" in Tamil. Then with a cup of tea and formal introduction we set out on a visit to Thathaiyar Kulam. Mr. C. Jeya Perinbakumar, Assistant Conservator of Forest (ACF) was made in charge of the field staff during the two-day program. He was very smart in handling the staff by motivating them.

## **Bird Watching and identifying**

On the way to Thathaiyar Kulam, Bronze-winged Jacana (Karumpachai Ilaikozhi) and Pheasant-tailed Jacana (Neelavaal Ilaikozhi) were noticed in a small pond. Cattle Egret (Unni Kokku), Little Egret (Chinna Kokku), Little Cormorant (Siriya Neer kagam) and Open-billed Stork (Nathaikuthi Narai) were found in the nearby paddy fields searching

for their feed. While assembled under the Banyan tree on the bund of Thathaiyar kulam, we could watch flocks of Coots (Nama Kozhi), Cotton Teals (Kulla Vaathu) and Lesser Whistling Teals (Siriya Seezhkai Siravi). The field staff were requested to refer to the books and learn about the birds. They were very happy to watch the birds through binoculars. Dr. S. Balachandran was explaining about Little Grebe (Mukkulippan), Indian Pond Heron (Madaiyan or Kuruttu Kokku), Black-crowned Night Heron (Ira Kokku or Vakka) and Common Teal (Kiluvai). By noticing a pair of Spot-billed Duck (Pullimookku Thara) and Northern Shoveller (Thattaivayan) distantly through my binoculars, I instructed our staff to watch the birds through binoculars and refer to the books for further information. All of a sudden, the sky above us was encircled by nearly 2000 Glossy Ibises (Jolikkum Arival Vai Narai). Immediately our staff were alerted to watch the marvelous scene of thousands of birds flying in the sky. Really it was a wonderful sight and many of us stood there in awe admiring the interesting scene. A lone Red Wattled Lapwing (Sivappu Meesai Aalkaatti) was raising alarm by seeing the intruders. The sight of a flock of Small Green Bee-eaters (Siriya Pachai Panchuruttan) sallying after insects, a Tree Pie (Mankuyil or Kanakkai) and a Roller or Blue Jay (Panankadai) sitting on the nearby trees were quite

thrilling to watch at close quarters with the help of the binoculars.

Theroor tank is located next to Thathaiyar Kulam. While moving towards Theroor tank, we could watch a flock of Median Egrets (Naduthara Kokku), a lone Large Egret (Periya Kokku) and a Grey Heron (Sambal Kokku). A Purple Heron (Senneela Kokku) was found in its flight at a distance. A mixed herony of Little Cormorants, Darters (Pambu Thara) and Pond Herons was fascinating to watch indeed.



***Identifying a distant flying.  
Purple Heron***

We reached Suchindram tank on the western side. This is a bigger tank when compared to all other irrigation tanks in the district. In the middle of the tank, an island is formed with a few trees. Quite a number of Coots were found there. A flock of Spot-billed Pelicans (Pulli Alagu Koozhaikada) was found in the center of the tank at a distance. Common Moorhen (Kula Kozhi) and Purple Moorhen (Mayil Kaal Kozhi) were found stalking through the vegetation in search of feed. A Darter was swimming with its body

submerged, showing its snake-like neck above the surface and swaying this way and that. A pair of Open-billed Storks was noticed in the paddy fields on the other side of the tank. A flock of Terns was flying here and there. With the help of the binoculars, Dr. S. Balachandran could identify them as Common Terns (Aalaa).

On we reached Manakudy Salt Pan, we were greeted by flocks of Black-winged Stilts (Nedunkaal Ullan) and Little Stints (Kosu Ullaan). Common Red Shank (Senkaal Ullan or Pavalakkaali), Common Green Shank (Payinkaal Ullaan or Pachchaikkaali), Little Ringed Plover (Siru Aarap Plover or Sinna Pattani Uppukkothi), Kentish Plover (Kentish Manal Plover or Kentish Pattani Uppukkothi), Common Sandpiper (Manal Ullaan or Man Kothi), Curlew Sandpiper (Valai Mookku Manal Ullaan or Valai Mookku Mankothi) and Marsh Sandpiper (Sadhuppu Manal Ullaan

or Sadhuppu Mankothi) were found in large numbers. Dr. S. Balachandran and Mr. P. Sathyaselvam (Junior Scientist) were helping the field staff in identifying the birds by describing the colour, size, shape, etc. Hundreds of Northern Pintails (Oosivaal Vathu) were noticed at a distance. We could watch flocks of Eurasian Spoonbills (Thuduppuvayan), Spot-billed Pelicans (Pulli Alagu Koozhaikkada), Painted Storks (Senkaal Narai) and Flamingoes (Poo Naarai) only with the help of the binoculars from a long distance. It took considerable time to watch the birds since all had to use the binoculars. A good number of Gulls (Kadal Kaakkai) and Terns (Aalaa) were found flying in the sky. They were identified as Great Black-headed Gull (Karuppu Thalai Kadalkaakkai) and Common Tern (Tern or Aalaa) by Mr. P. Sathyaselvam.



*Bird banding traininig at puthalam*

The salt pan area that belongs to State Government has been leased out to private persons for production of salt. Since knee deep water is maintained there, it is found to be ideal for the water birds. Though the salt producers cause no harm to the birds, it is complained that at times, some of the local urchins indulge in collection of eggs especially of Black-winged Stilt, etc. While everybody was busy watching the birds, a large flock of nearly 500-Flamingoes started rising high up in the air and soon they flew above us. The Greater Flamingoes with bright red plumage in flight is certainly a sight to behold. For want of a good camera, that wonderful sight could not be photographed. Almost all our field staff were in a state of great excitement, because that was the very first occasion for us to have a glimpse of the colorful birds at close range.

At about 3 pm, the afternoon session was organized in the rest house with a power point presentation on water birds by Dr.S.Balachandran and his associate Mr.P. Sathyaselvam. The staff were given the opportunity to clarify their doubts. Some of the inquisitive staff posed many interesting questions and the session was very lively.

## Bird banding

Bombay natural History Society (BNHS) is the authorized agency in India

to conduct bird banding. Point Calimere Wildlife and Bird Sanctuary conducts the bird banding programme regularly. Chilka Lake Bird Sanctuary in Orissa is also involved in bird banding. Trained staff brought from Point Calimere had been deployed the previous night itself to Puthalam salt pan for netting the birds for ringing them the next day.



*Flamingos ready for banding*



*Banding of flamingo*



### Banding of glossy ibis

On 24<sup>th</sup> sharp at 6 a.m, we proceeded to Puthalam. When we reached the place, we could see the field staff already with the netted birds of two Flamingoes, two Glossy Ibises, one Long-toed Stint (Neelakkal Kosu Ullaan), one Red Shank, one Tailor bird (Thaiyal chittu) and one Purple rumped Sunbird (Oodhaa Pitta thaen sittu)

There are nine sizes of rings being used in India. The ring sizes are represented by the letters of the alphabet. L is the largest ring and Z is the smallest ring. The diameters of different rings are as follows: Z=2mm, A=2.5mm, AB=3.5mm, B=4.5mm, C=6.5mm, F=9mm, G=11mm, K=16mm and L=19mm.



**Release of red shank by the collector  
Mr rajendra ratnoo IAS**

The bird caught through mist net has to be handled properly while banding. Both the legs of the bird have to be checked to make certain that it is not already ringed. The correct ring size has to be selected. Proper banding pliers have to be used to close the ring tightly without any projecting



### Release of little stint by the dfo

sharp corner. Before ringing, the weight of the bird, the linear measurements of wing, bill, total head, tarsus and tail are to be measured and recorded in the data sheet. The name of the Banding authority, Banding location and habitat, Ring size, Species name, Age, Sex, Date and Time are to be recorded in the data sheet.

Small birds should be allowed to take off by opening the hands. Birds with long wings and short legs should be released by holding them by the legs. While releasing the ringed birds care should be taken to avoid predators like carnivorous birds, feral dogs and cats.

After recording all the measurements in the banding sheet, first it was decided

to ring the Flamingoes. The Collector Mr. Rajendra Ratnoo., IAS., also joined us in all earnestness. In his presence the birds were ringed. Dr. S. Balachandran and Mr. P. Sathyaselvam were ringing the birds. While ringing, they were explaining every step very clearly for the sake of the Forest Officials who had come over there to attend the training. The method of bird banding, reasons for banding and the advantages were all explained to the Press persons by the Scientist. The Collector also gave an interview about the program. I too shared my ideas and the feasibility of bird banding in Kanyakumari district. Bird banding is undertaken to track the migratory routes of birds and the data collected about the ringed birds through recapture help the ornithologists to study the life and movement pattern. Only through bird banding we have come to know that some of the migratory birds which visit India fly their way from Russia, Siberia and Middle East crossing the Eastern Himalayas. Presently satellite tracking is the best method with direct connection; but it is expensive. An adult Little Stint banded in USSR on 9.8.1977 was recovered at Point Calimere on 25.8.1990, 13 years and 16 days after banding. A Flamingo *banded in Iran* was recovered at Thanjavur. Pintail, Common Teal, Garganey or Grey winged Teal, Marsh Sandpiper, Forest Wagtail, etc., are some of the migratory birds.

After completion of banding, the Flamingoes were released by the Scientists; because being larger birds handling and releasing should be done carefully. After that, the Long-toed Stint was placed in the hands of the Collector for safe release. I was given the opportunity of holding the Little Stint in my hands and releasing it delicately by opening my hands. Mr. C. Jeya Perinbukumar, ACF released the Purple-rumped Sunbird and Mr. Mangavilai D. Rajendran, Program Executive of All India Radio (AIR), Nagercoil, who was doing live coverage of the entire bird banding program, released the Tailor Bird.

The Collector congratulated me and the ACF and the field staff and thanked the press persons who had gathered there to cover the entire programme, especially Mr. Mangavilai D. Rajendran for the live coverage through AIR, Nagercoil.



***Elegant Gait Of Banded Glossy Ibises***

The two banded Glossy Ibises were released on the ground and it was really a feast to one's eyes to watch their elegant gait. Though, bird migration study through bird banding was introduced in India as early as 1959, it has taken nearly half-a-century for the Forest Personnel of Kanyakumari Division to learn this technique. This was the very first training programme of this kind organized for the field staff of this Division. I was very much satisfied that my idea of imparting this kind of training to the field staff through BNHS Scientists and was fulfilled successfully.

Finally the two-day programme got over. The Scientist Dr. S. Balachandran, Mr. P. Sathyaselvam and other field staff who had come from Point Calimere, the Press persons, Mr. Mangavilai D.Rajendran, Mr. C. Jeya Perinbakumar, ACF, the Forest Range Officers and all the other field staff who attended the programme were thanked for their support and cooperation with the satisfaction of accomplishing this maiden venture.



## VETERINARIANS GET TRAINED IN CLEANING OIL-SLICKED BIRDS



A group of wildlife veterinarians from across India participated in a hands-on training session on cleaning oil-slicked birds at Besant Memorial Animal Dispensary, drawing critical lessons from the Dec 2023 Ennore oil spill. The spill, caused by a crude oil leak from Chennai Petroleum Corporation Limited, affected Kosasthalaiyar river, Ennore Creek, and Bay

of Bengal, leaving several birds coated in sticky oil and unable to move.

Led by Wildlife Trust of India (WTI) and its chief veterinarian N V K Ashraf, the training provided a live demonstration of rescue, cleaning, and rehabilitation techniques.

Ashraf pointed out that the first crucial step in handling such incidents is the safe rescue of birds. Their eyes are covered to minimise stress before they are transported to treatment sites. Vets then use a combination of vegetable oil and mild dishwasher liquid to remove oil from the birds' feathers. The cleaning process must be conducted with precision as improper technique can render birds flightless.

With the insights gained, participating veterinarians are now better equipped to respond effectively to future oil spills, he said.

Courtesy: The Times of India dated 24.01.2025

# THE REALITY OF INFANT KILLING IN BIG CATS

G. Sivagurunathan,

Former Assistant Conservator of Forests (Retd)

## EXPLORING THE ALLURE OF FOREST MYSTERIES

The forest, a realm of hidden wonders, harbours a tapestry of life and countless secrets. Among these secrets lies the enigmatic phenomenon of infanticide within big cat populations. This research seeks to unravel the intricate web of factors – evolutionary, ecological, and behavioural – that contribute to this act, shedding light on the complexities of animal behaviour and informing crucial conservation efforts.

### INFANTICIDE IN CARNIVORES ANIMALS

An infant is a “perfect contraceptive,” and infanticide simply serves to remove this effect (Altmann et al. 1978).

Studying infanticide in wild carnivores presents significant challenges. These animals are often solitary, secretive, and active at night, making direct observations difficult. Additionally, females carefully conceal their young in secluded locations, further hindering

research. While many infanticide theories are based on observations of captive animals, insights from wild populations are also crucial for a comprehensive understanding.

Adult males play a vital role in the population dynamics and reproductive success of carnivore species. The removal of established males can trigger an influx of new males, potentially leading to reduced cub survival and slower population growth. Infanticide committed by these incoming males is a reproductive strategy. By killing the offspring of the previous dominant male, they can induce the mother to enter oestrus sooner, increasing their own chances of fathering offspring.

### THE REALITY OF INFANT KILLINGS IN BIG CATS

#### *Male Strategies, Female Counter Strategies in Tigers*

While evidence suggests that female lions (*Panthera leo*), brown bears (*Ursus arctos*), and jaguars (*Panthera onca*) employ strategies to avoid sexually selected infanticide (killing of cubs by incoming males to increase their mating opportunities), data on tiger (*Panthera tigris*)

behaviour is limited to anecdotal observations. This study aimed to observe how female tigers respond to the arrival of immigrant males to prevent their cubs from being killed.

Faced with this threat, female tigers have limited options. They can either relocate to a new territory outside the incoming male's range or remain in their current territory and defend their cubs. Relocating may force them into less suitable habitats, increasing their vulnerability to environmental challenges. Alternatively, defending their cubs against attacks from the incoming male can expose them to significant risks of injury or even death.

Renowned tiger conservationist Valmik Thapar recounted a dramatic incident from 1981 in Ranthambore. A tigress, while walking with her cubs on a full moonlit night, encountered an adult male. In a swift and decisive move, she attacked the male from behind, inflicting fatal wounds with her claws and canines. The tigress then proceeded to consume part of the male's hind leg, a behaviour often observed in cases of tiger cannibalism, likely a display of dominance.

Similar incident was documented by British forest officer W.D. Ritchie in 1950 in Assam, where a tigress killed a large male to protect her



**ST-10 tigress with her cub. The picture at Sariska Tiger Reserve (STR) has caught the attention of wildlife lovers (Photo from Rajasthan Forest Department)**

cubs and subsequently consumed a portion of his carcass.

In another incident from Ranthambore Tiger Reserve in 2009, a female with cubs fiercely defended them against an intruding male. While she successfully repelled the male, the female succumbed to the injuries sustained during the confrontation, as confirmed by a post-mortem examination. These instances highlight the fierce maternal instinct of tigresses and their willingness to risk their lives to protect their offspring from potential threats, including infanticide by rival males.

Tigresses employ a strategy similar to lions to safeguard their cubs. In Panna National Park, researchers observed that females, after mating with dominant males, would also mate with “floaters” – non-territorial males. This behaviour, initially considered unlikely due to the assumption that floaters were unable to breed, suggests a strategic manoeuvre by the tigresses. By mating with floaters, they may be seeking to appease potential aggressors, effectively trading sexual favours for a sense of security.

In another instance, in Ranthambore, an elderly tigress, Noor, after relinquishing her territory to her daughter, moved into an area inhabited by three males. Remarkably, photographer Aditya Singh observed Noor mating with

all three males within a single day. These observations highlight the complex social and reproductive dynamics within tiger populations, demonstrating the intricate strategies employed by tigresses to ensure the survival of their offspring.

## THE FATHER'S LOVE IN THE WILD

In December 2010, a tigress named T-5 gave birth to two cubs in Ranthambore Tiger Reserve (RTR). This was a joyful event celebrated by the local community and conservationists, who hoped for a successful future for the cubs and the on-going tiger conservation efforts. Sadly, in February 2011, T-5 died from a digestive illness, leaving her cubs orphaned. This was a significant setback, as tiger cubs heavily rely on their mothers for survival in the wild.

Statistics show that less than half of all tiger cubs survive to adulthood, emphasizing the crucial role of their mothers in their early development. Cubs usually stay with their mothers for about two years, learning vital hunting and survival skills before establishing their own territories. The loss of their mother left the two orphaned cubs facing a precarious future, as forest officials were deeply concerned. It was clear that without their mother's protection and guidance, the cubs' chances of survival were significantly reduced.

In a surprising turn of events, the cubs' father, T-25, unexpectedly stepped in to care for his offspring. This was the first recorded instance of a male tiger assuming the role of caretaker in the Ranthambore Tiger Reserve. Male tigers are typically solitary and not known for their paternal instincts. However, T-25 defied this expectation, showcasing a remarkable ability to nurture his young. He not only protected them from other tigers but also actively participated in their upbringing. Conservationists observed him teaching the cubs essential survival skills, a role usually played by the mother. This included disciplining them to ensure they learned the necessary lessons for life in the wild.

It was heart-warming to witness the father-tiger's dedication as he prepared his cubs for the challenges of life in the reserve.

The bond between T-25 and his daughters showed not just his nurturing side, but also how remarkably he adapted to a difficult situation. This inspiring example gives hope to wildlife conservationists. It reminds us that nature is full of surprises, and incredible animal behaviours can emerge in the most unexpected ways. The story of T-25 and his daughters demonstrates the resilience of wildlife and the importance of protecting these amazing creatures through conservation efforts.



**Tigress ST-9 territory marking in Sariska Tiger Reserve**  
*(Photo by Hemant Singh)*

In 2013, the orphaned tiger sisters, ST-9 and ST-10, were moved from Ranthambore to Sariska Tiger Reserve to increase their chances of survival. Despite concerns about potential conflicts with humans, the relocated sisters have successfully adapted and are now contributing to the tiger population in the reserve.

### **LIONESS STRATEGY: DECIVING MALE LIONS TO PROTECT CUBS**

Male lions engage in infanticide, killing cubs that are not their own. This brutal behaviour, common among large cats, benefits the male lion by quickly making the mother fertile again, increasing his chances of fathering offspring. While young lions might survive the initial attack, their dependence on their mothers for survival leaves them vulnerable and unlikely to thrive.

Male and female lions typically live in separate groups. In Asia, male lions often form pairs to defend their territory and hunt prey. These male coalitions may have overlapping territories with multiple prides of females. This proximity and the presence of numerous male groups increase the risk of infanticide for cubs within a pride.

Lionesses defend their cubs by working together, but they are often outnumbered by rival males. Despite this vulnerability, lionesses have evolved clever strategies for survival.

The intricate social lives of lions make it nearly impossible to determine the father of a cub. Cubs commonly form close bonds with multiple males and nurse from several mothers. This unusual behavior is not accidental but a deliberate strategy by the lionesses.

Researchers believe that experienced lionesses intentionally confuse paternity. They mate with the dominant males in their territory but also seek out other males, only conceiving after mating with multiple partners. This differs significantly from the mating behaviour of their African counterparts, who typically remain faithful to a single pair of males.

Asia male lions encountering a pride of cubs cannot easily determine which, if any, are their own. Cubs lack distinctive markings or sounds that would reveal their paternity. However, the males can recognize the mothers they have previously mated with.

“All the males consider the cubs their own because of female promiscuity,” says Chakrabarti. Females outwit the males in this entire game.

Inexperienced lionesses may only mate with one group of males, making their cubs more vulnerable to infanticide. However, the pride often collectively cares for the cubs. Multiple mothers may nurse a group of cubs without favouring their own,

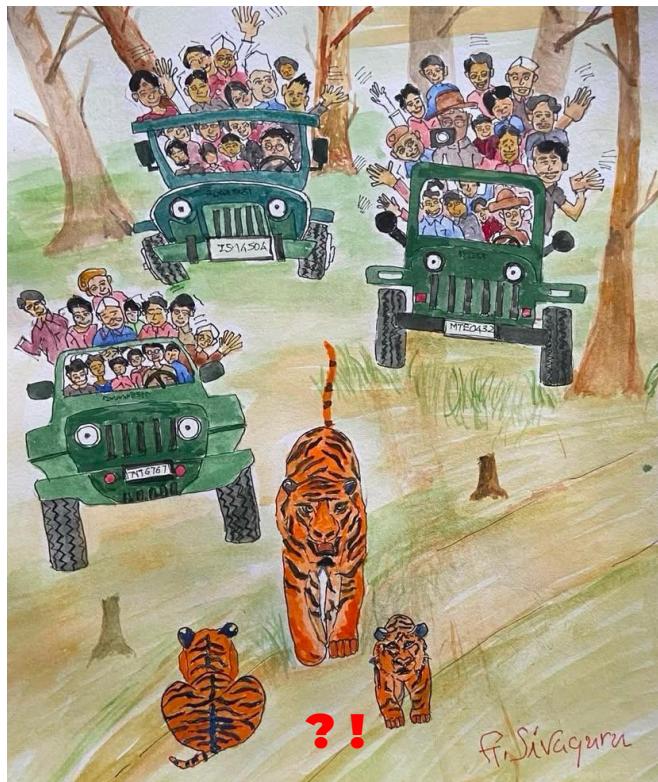
making it difficult to determine which cub belongs to which mother. This confuses other male lions, who may mistakenly believe they are the fathers and spare the cubs.

This strategy relies on the stability of the social group. While females remain in the same area, males frequently challenge each other for dominance. When a new group of males takes over, cubs fathered by the previous males are at risk of being killed. Despite the lionesses' efforts, infanticide remains a significant threat to cub survival, accounting for a substantial portion of cub deaths.

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.....To be continued next issue



**Cartoon by G. Sivagurunathan, ACF (Retd)**

# BIRTHDAY *Celebration*



**Thiru M. Harikrishnan IFS., Retired Principal Chief Conservator of Forests & former Head of Tamil Nadu Forest Department celebrated his 87th birthday at Malleswaram club, Bangalore on 02 January 2025. This function was organised by Dr Mallesappa IFS, PCCF & HoFF (Retd) and attended by Thiru A. Ramkumar IFS, PCCF (Retd) Thiru P. L. Anandsamy IFS, PCCF (Retd), Dr H. Basavaraj IFS, PCCF & HOFF (Retd), Thiru V. Ganesan IFS, APCCF (Retd) and Thiru K. Dhanapal, DCF(Retd) all from Tamil Nadu Forest Department**

## NAMATHU VANAM

Feb 2025 -Apr 2025

Training programs of Advanced Institute for Wildlife Conservation (Research, Training & Education)



Inaugural session of the Wildlife Conservation & Forensics course, the proceedings of our Third Annual Research Conference (ARC) were officially released. The event was graced by distinguished officials, including Dr. P. Senthilkumar, IAS, Principal Secretary to the Government, Environment, Forests and Climate Change & Mr. Srinivas R. Reddy, IFS, Principal Chief Conservator of Forests (PCCF) & Head of Forest Force (HoFF).



Thiru L. Abdul Hameed (Tamil Nadu) awarded for overall top trainee award in the Wildlife Conservation and Forensics Courses by PCCF & HoFF, TN.  
L to R - Dr H. Dileep Kumar, IFS, (DD, AAZP) Thiru A. Udhayan, IFS, PCCF & Director, (AIWC) Thiru Srinivas R Reddy, IFS, PCCF& HoFF, Selvi Mita Banerjee, IFS, PCCF (R&E) Thiru Rakesh Kumar Dogra, IFS, PCCF CWLW, Thiru D. Eswaran, DD (AIWC)



AIWC conducted a Training Program on Wildlife Forensic Sample Collection for 30 frontline forest staff. The training enhanced their ability to collect forensic samples for wildlife crime investigations.



Range Forest Officer Trainees from Karnataka Forest Academy visited AIWC & the officials explore the role of wildlife forensics in conservation. They gained valuable insights into the application of forensic science in wildlife protection.



Students from IIFM, Bhopal visited and exploring our Centre and Wildlife Forensic lab, gaining key insights into wildlife forensics, conservation & management



Trainees participated in a Lab - Practical Session on Wildlife Forensics Morphometry at the Centre for Wildlife Forensics! Led by Dr. D. Vasanthakumari, Forest Veterinary Assistant Surgeon at AIWC, along with the talented research team, participants learned critical techniques in wildlife morphometry for forensic identification.