भारतीय वन्यजीव संस्थान
Wildlife Institute of India

# WII'S E-NEWSLETTER

MONSOON 2023

## XIX M.Sc. (Wildlife Science) Course 2023-25

The XIX MSc Wildlife Science Course commenced with effect from 7 August 2023 with a capacity of 20 students, including eight WII Sponsored and twelve Self Sponsored. These students are from 11 states of India, with diverse backgrounds and interests. Dr. K. Ramesh, Scientist-F and Dr. Vishnupriya Kolipakam, Scientist-D, will serve as Course Director and Associate Course Director, respectively. Currently, the inputs for Semester I are being delivered, with subjects such as Biogeography, Fundamentals in Ecology, Plant Systematics and Vegetation Science and Forestry and Natural Resource Conservation. The students are now preparing for their field tour. They would be on an Orientation Tour to Lansdowne Forest Division from 4-8 September 2023, led by Dr. Bivash Pandav, Scientist-G and other faculty members. Contact: ramesh@wii.gov.in

## International Tiger Day 2023 celebrated at WII, 29 July to 7 August 2023.

The Wildlife Institute of India, in association with The Times of India and Swami Rama Himalayan University, celebrated International Tiger Day 2023 from 29 July to 7 August 2023. Garhwal Mandal Vikas Nigam, The Tons Bridge School, Hotel Saffron Leaf, Kamal Jewellers, Doon Art Council and Hotel Inderlok supported it. Nineteen schools participated in various activities.



The students attended sessions like Nature Trail visits, Wildlife Photography, Talks on Tiger Conservation, Use of Technology in Tiger Conservation, Photo Exhibitions, etc. Uttarakhand Forest Department displayed a wildlife photo exhibition. Achintya Singh and Jenisha Aggarwal also conducted Wildlife photography workshop sessions for students.

The participating schools from Dehradun were Doon Global School, Welham Boys' School, Doon Girls' School, Welham Girls' School, Guru Nanak Academy, St Jude's School, Doon Yudhishtera Public School, Himalayan Public School, Doon Presidency School, The TonsBridge School, Olympus High, Raja Ram Mohan Roy Academy, Universal Academy, Pine Hall, Shri Ram Centennial School, Doon Heritage School, Rose Mount School, Doon Valley International School and Brooklyn School.

The concluding ceremony was held at the Institute on 7 August 2023. The dialogue explored the topic 'Conserving Our Stripes: Tigers, Wildlife, and Tourism'. At the outset, Shri Virendra R. Tiwari, Direc¬tor, WII, enlightened everyone on WII's contribution to Project Tiger, followed by the screening of a film on wildlife titled 'Return of the Magnificent Gaur in Sanjay Tiger Reserve: A Success Story' by Dr Parag Nigam and Shri Ritesh Vishwakarma, WII. The event also featured three engaging panel discussions: (i) Living on the Edge of Humans, (ii) Tiger Conservation: Challenges and Pathways Forward, and (iii) Tiger & Tourism: Balancing Economics and Responsibility. The event served as a platform for the participants to deepen their understanding of the interaction between humans, wildlife, and sustainable tourism.

Contact: https://wii.gov.in/

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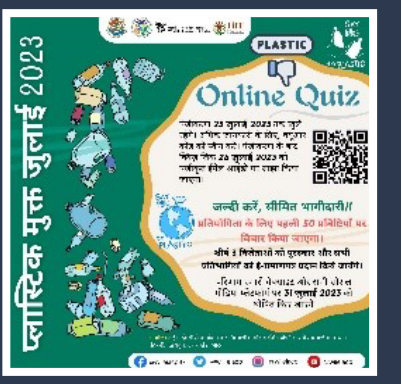
# EIACP
# Programme Centre

## Online Quiz on 'Plastic Free July', 2023

"Plastic-free July" is a global movement for the whole month of July to encourage people to reduce plastic usage and waste. EIACP Programme Centre, Wildlife Institute of India, Dehradun, organised an online quiz on "Plastic Free July 2023". The online quiz participation was open to all, and more than 110 participants registered themselves for this online contest. This online activity aimed to raise awareness on environmental issues associated with single-use plastics and inspire people to make more sustainable choices in their daily lives.
Contact: email: envis@wii.gov.in

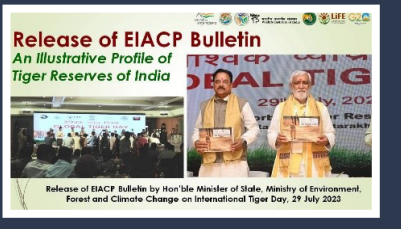



## Mission LiFE Programme in 59th Annual Meeting of the Association for Tropical Biology and Conservation Conference 2023, Coimbatore, Tamil Nadu, 6 July 2023.

The Association for Tropical Biology and Conservation (ATBC) is a scientific professional society formed in 1963 as the Association for Tropical Biology. The ATBC is global in scope, membership, and objectives, functioning as an international body to promote research, education, and communication of tropical biology and conservation. Recently, in July 2023, ATBC organised its 59th Annual Meeting Conference at Coimbatore, Tamil Nadu. Dr. K. Ramesh, Sc-F, led the event at the 59th Annual Meeting of the Association for Tropical Biology and Conservation.

EIACP Programme Centre, WII, organised the Mission LiFE Programme in the Annual Meeting. A group of more than 500 school students from a local school visited the WII-EIACP Programme Centre stall.


Dr. Ramesh Chinnasamy, Sc-E, briefed school students about the seven themes of Mission LiFE & various capacity-building activities performed by the EIACP Programme Centre. A Mission LiFE Pledge was conducted for school students during the ATBC conference. This activity aimed to bring together more than 500 school children, researchers, scientists and foreign delegates to raise awareness about the Mission LiFE as a mass movement for "mindful and deliberate utilisation, instead of mindless and destructive consumption" to protect and preserve the environment, which Hon'ble Prime Minister Narendra Modi introduced at COP26 in Glasgow on 1 November 2021. Contact: envis@wii.gov.in




Release of WII-EIACP Bulletin "An Illustrative Profile of Tiger Reserves of India", Corbett Tiger Reserve, 29 July 2023.

EIACP Programme Centre, Wildlife Institute of India, Dehradun published WII-EIACP Bulletin "An Illustrative Profile of Tiger Reserves of India," which was released by Hon'ble Union Minister of State, Ministry of Environment, Forest and Climate Change on International Tiger Day, 29 July 2023 at Corbett Tiger Reserve. This publication would provide information on the conservation status of tigers in our country. It would be a valuable handbook for researchers & wildlife managers working in the field of wildlife conservation.

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# 77th Independence Day Celebration, Dehradun, 15 August 2023.

India's 77th Independence Day was celebrated in the Wildlife Institute of India campus on 15 August 2023. Shri Virendra R. Tiwari, Director, WII, hoisted the national flag. He addressed the large gathering of faculty members, officers, staff, researchers and trainees and urged them to provide continued support in successfully meeting various challenges present before the Institute. He also informed the gathering about the major steps taken by the Institute in the recent past.

Shri Virendra R. Tiwari, Director, WII, appreciated the efforts of all employees in the Institute building. Shri Tiwari also distributed the certificates and cash prizes to the meritorious students of WII family members and motivated the Institute's sports contingent for their performance in the All India Forest Sports Meet. A Football Tournament was also organised on the occasion of the Independence Day.

Contact: dwii@wii.gov.in


# Wildlife Institute of India's 34th Annual Research Seminar Concludes on a High Note, Dehradun, September 21 to 22, 2023.

Under the aegis of the Ministry of Environment, Forest, and Climate Change, the esteemed Wildlife Institute of India (WII) successfully concluded its much-anticipated Annual Research Seminar on, within its scenic campus in Dehradun. Spearheaded by its proficient director, Shri Virendra R. Tiwari, the two-day seminar illuminated pressing challenges, innovative resolutions, and cutting-edge research within the domain of wildlife and conservation.

The inaugural address was delivered by Dr. Rajesh Gopal, who underscored the pivotal role of institutions like the Wildlife Institute of India and the wildlife researchers in shaping conservation practices both in India and globally. Guest of Honour, Shri Bharat Jyoti, IFS, Director IGNFA, shared his remarks and insights, emphasizing the importance of such gatherings in the larger context of wildlife conservation. The following publications prepared by the scientists and the researchers of the Institute were also released in the inaugural session: (i) Artificial Canopy Bridge Design focused on facilitating the movement of Western Hoolock Gibbon in Assam's Hollongapar Gibbon Sanctuary. (ii) An in-depth look into the Status of threatened medicinal and aromatic plants and their utilization by the Bhotiya community in Uttarakhand's Niti valley. (iii) Haryana State Biodiversity Strategy and Action Plan 2021-2030, highlighting the roadmap for biodiversity preservation in the state of Haryana. (iv) A user-friendly Pocket Guide to Amphibians ofw Namdapha Tiger Reserve, equipped with QR codes for frog calls. (v) An investigative report on the Influence of tectonic shift on carbon stock dynamics of mangrove forests in the Andaman Islands. (vi) The promising Amur Falcon conservation initiative.

The lead talks saw presentations by the scientists of the institute - Shri Qamar Qureshi's presentation on the ambitious Cheetah reintroduction project in India was a session highlight. Aimed at re-establishing the cheetah within its historical range, this first intercontinental reintroduction of a wild, large carnivore species offers invaluable insights for global conservation efforts, showcasing WII's commitment to balancing development with wildlife conservation.

Dr. Bilal Habib highlighted the balance between economic growth and environmental protection, empha-

sizing sustainable development as a means for conserving biodiversity. Another lead talk by Dr. Sutirtha Dutta reviewed the first phase of the 2019-initiated conservation breeding program aimed at preventing Great Indian Bustard (GIB) extinction. Under the Bustard Recovery Program, breeding centre was established in Jaisalmer, Rajasthan, where wild-laid eggs are collected, hatched, and chicks are hand-reared using a new scientific approach. The program has seen initial success with natural breeding commenced and efforts toward assisted reproduction to boost captive reproductive output in progress.

Last day was an enriching experience starting with a Speed Talks session. Topics included the acoustic patterns of Ganges River Dolphins and the role of eDNA in biodiversity monitoring. A vibrant poster session, showcased captivating presentations on diverse topics. The concluding session marked the wrap-up of the seminar, chaired by Dr. Rajesh Gopal and co-chaired by Shri Virendra R Tiwari, summarizing the key takeaways from the two-day discussion. The awards segment showcased the promising work of emerging wildlife scholars and photographers, who have captured nature's essence through their lenses. ARS 2023 saw the launch of six publications and a total 6 lead talk, 26 oral presentations, 11 speed talks and 31 posters presented at the ARS in eight technical sessions. The awards were given to the following researchers:

Shri Virendra R. Tiwari, Director, WII said on the occasion that “The Annual Research Seminar at the Wildlife Institute of India showcased a variety of efforts aimed at protecting the rich biodiversity. It served as a vibrant platform displaying the profound research endeavours undertaken at the institute. The collective insights garnered during these engagements propel our research initiatives into new dimensions, ensuring a continuous enhancement in the quality of our work which is fundamental to the rigorous field of wildlife conservation and study.” The Chief Guest, Dr. Rajesh Gopal, IFS, Secretary General, Global Tiger Forum, and TRAC Chairman said that "In the panorama of conservation, the vital role of thorough research and the relentless pursuit of knowledge cannot be overstated. As we navigate through the current conservation challenges. It is wildlife researchers, who stand as beacons of hope. Their ability to blend scientific rigor with a deep empathy for nature forms the bedrock of future conservation strategies. This seminar has not only been a showcase of innovative research but a compelling demonstration of the promising future that well-informed, dedicated researchers are sculpting in the realm of wildlife conservation.” Research Coordinator, Dr. Bitapi C Sinha told that "The tapestry of research unfolded at this seminar illustrates the dedication, diversity, and dynamism inherent in our academic community. Each presentation, poster, and dialogue has contributed to the growing repository of knowledge essential for navigating the intricate pathways of conservation in a rapidly changing world."

## XVI — Internal Annual Research Seminar (12-14 September 2023)

**Oral Presentation Awards**

| Rank | Name |
|---|---|
| I | Malaysri Bhattacharya |
| II | Tribhuwan Singh |
| III | Prasad Tonde |

## XXXIV —Annual Research Seminar (21-22 September 2023)

**Oral Presentation Awards**

| Rank | Name |
|---|---|
| I | Supratim Dutta |
| II | Akanksha Saxena |
| III | Priyanka Justa |

**Poster Presentation**

| Rank | Name |
|---|---|
| I | Thirumurugan V. |
| II | Shekhar Sarkar |
| II | Aarti Chauhan |
| III | Sameeha Pathan |

**Speed Talks**

| Rank | Name |
|---|---|
| I | Sagar Rajpukar |
| II | Akshayi AS |
| III | Uddalak Bindhani |

**Photographic Competition**

| Rank | Name |
|---|---|
| I | Moulik Sarkar |
| II | Sagar Rajpurkar |
| III | Ameya |
| Jury Special | Rohan Desai |

**Field Research Activity**

| | |
|---|---|
| I | Ritesh Vishwakarma |
| II | Gaurav PJ |
| II | Moulik Sarkar |

**Non-Theme**

| | |
|---|---|
| I | Moulik Sarkar |
| II | Ajay Chauhan |

**Camera Trap**

| | |
|---|---|
| I | Gaurav PJ |
| II | Ayan Khanra |


# भारतीय वन्यजीव संस्थान में हिंदी पखवाड़ा मनाया गया, 14 से 28 सितम्बर 2023

भारतीय वन्यजीव संस्थान में 14 से 28 सितम्बर 2023 हिंदी पखवाड़ा मनाया गया. इस अवसर पर संस्थान में 27 सितम्बर 2023 को 'स्वच्छ भारत अभियान' विषय पर एक निबंध प्रतियोगिता भी आयोजित की गई। जिसमें संस्थान के वैज्ञानिक, शोधकर्त्ताओं, अधिकारी एवं कर्मचारियों ने भाग लिया। इस प्रतियोगिता में प्रधान तकनीकी अधिकारी, श्री कृष्ण कुमार श्रीवास्तव को प्रथम स्थान एवं शोधकर्त्ता, सुश्री ऐश्वर्या को द्वितीय स्थान प्राप्त हुआ।

संस्थान में हिंदी पखवाड़े का समापन समारोह 29 सितम्बर 2023 को आयोजित किया गया। समारोह के दौरान सभी को बताया गया कि राजभाषा आदेशों का अनुपालन करना हर एक सरकारी कर्मचारी का कर्त्तव्य है एवम् हिंदी के प्रयोग, संवर्धन, जागरूकता एवं प्रोत्साहन से अपनी प्रतिभागिता बढ़ाने का अनुरोध किया गया। संकाय सदस्यों, शोधकर्त्ताओं, अधिकारियों एवं कर्मचारियों ने समापन समारोह में अपनी प्रतिभा. गिता दी। हिमालयन जड़ी–बूटी शोध के बारे में जानकारी दी गई। प्रतिभागियों ने कविता पाठ किया। कार्यक्रम के अन्त में, संस्थान के कुलस.चव, डॉ एस सत्यकुमार द्वारा हिंदी के प्रयोग पर चर्चा की गई एवम् विजेताओं को पुरस्कृत किया गया।

# Observation of Indian Wolf Pack Feeding on Goat Carcasses along National Highway 7

*- Akanksha Saxena, Adrian W. Lyngdoh, Asha Rajvanshi, Bilal Habib*

The Indian wolf, *Canis lupus pallipes* is a large predator of the Indian subcontinent and is widespread in forested and human-dominated landscapes. The canid alternates between wild and domestic prey with changes in habitats and is known to thrive in human-dominated landscapes. We report an observation of a pack of three wolves scavenging on goat carcasses on the verge of the busy National Highway 7, an arterial highway in India. Though wolves are known to be scavengers of cattle and livestock carcasses in human-dominated landscapes, such encounters near high-speed and traffic roads could be potentially fatal to wolves in human-dominated landscapes.

The Indian wolf is a canid ranging over much of India and is categorised as Least Concern (LC) by the IUCN. It is listed in Schedule I of the Wildlife (Protection) Act, 1972, along with the Indian national animal, the tiger. It extensively uses areas along the periphery of protected forests and prefers scrubland, grasslands and semi-arid pastoral/agricultural areas. Wolves are known to approach human dwellings but prefer habitat pockets with visual cover and shade during the day. In landscapes with a good prey base, wild prey can form up to 75% of the wolves' diet, with 21% of feeding events consisting of scavenging on domestic cattle carcasses. Conversely, in areas with low natural prey populations, a large proportion of wolves' diets (ranging from 63 - 100%) comprises domestic prey.

We report an incident that occurred in the early morning (6 a.m.) of 10 November 2017, where a pack of three wolves was observed scavenging on garbage and livestock carcasses on National Highway 7 near Pench National Park and Tiger Reserve, Madhya Pradesh, India.

The traffic in the morning was light, comprising only a few trucks and the odd cyclist. We found the three wolves wandering about the edges of the highway, occasionally crossing the highway whenever the traffic subsided. The three wolves found a small pile of garbage on the side of the highway and spent about 2-3 minutes rummaging through the plastic and paper waste. After a while, with little to no success finding food, they split into two groups and continued their journey along the highway. One of the wolves found a goat carcass lying on the roadside and managed to drag it towards the forest edge before finally disappearing into the thickets within a few minutes.

The other two wolves chanced upon another goat carcass lying about 6 m from the road, a little ahead of the former. One of the wolves immediately started tearing at the carcass while another seemed to keep guard. After a while, the wolf that was keeping watch went back into the forest. The first wolf, however, continued feasting for another half hour before it, too, decided to return to the woods, but it failed to drag the carcass with it. The entire observation lasted about 45 minutes.

One of the authors was part of a team that surveyed this road stretch in 2015 when they came across a similar instance of a wolf feeding on discarded chicken waste that seemed to have been disposed of by a poultry shop. These incidents reveal yet another impact of roads on wildlife. Provision of carcasses along the roadsides, often thrown by vehicles transporting livestock, could lead to an 'ecological trap' like a situation where the roadsides may become an easy place to find food for the wolves. Additional food resources originating from the road could be roadkill for wild animals. Even though wolves are accustomed to living in human-dominated landscapes, such provisioning of food near high-traffic highways could heighten the risk of fatalities due to collisions with vehicles.

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*"A pack of three Indian wolves exploring the National Highway 7 during early morning hours" © Adrian Lyngdoh*

*"A pack of Indian wolves scavenging on garbage on the verge of National Highway 7, central India" © Adrian Lyngdoh*

*"An Indian wolf feeds on a discarded goat carcass as another keeps watch" © Adrian Lyngdoh*

*"A wolf trying to pull the goat carcass towards the forest" © Adrian Lyngdoh*

# Celebrating the Mermaids: Online World Dugong Day

*- Chinmaya Ghanekar and Oishinee Chakraborty*

When the world stayed indoors due to a virus, the scientific community persevered, tirelessly continuing their research, conferences, webinars, and other intellectual pursuits! During the lockdown, the CAMPA Dugong team of the Wildlife Institute of India had a fantastic idea to unite the virtual community and commemorate our beautiful Mermaids on 'World Dugong Day!' The initiation of World Dugong Day in India could not have a better date than 28 May, as India's dugong conservation endeavours commenced on that same day in 2008. On this significant occasion, on behalf of India, the esteemed Secretary of the Ministry of Environment, Forests & Climate Change appended their signature to the Memorandum of Understanding concerning the Conservation and Management of Dugongs and their Habitats throughout their range.

Dugongs inhabit the shallow coastal warm waters, feeding primarily on marine flowering plants called seagrasses. Within India, these marine herbivores are found in the Gulf of Kutch, Gujarat, the Gulf of Mannar & Palk Bay, Tamil Nadu, and the Andaman Nicobar Islands. Considered 'Vulnerable' by the IUCN red list, they are Schedule-I species of the Wildlife Protection act, 1972 in India. For most of the world, apart from the dugong-ranging nations, they still embody the essence of the mythical mermaids. The online universe provides a platform to introduce these relatively obscure marine mammals to the world. We bagged this opportunity to create awareness through social media campaigns and immersive virtual gatherings, where people from diverse backgrounds can acquaint themselves with dugongs and the habitats they call home.

A small team worked tirelessly to create 50 posts across three social media platforms, reaching about ten-thousand people. On Twitter, Instagram, and Facebook, two infographic posts were shared each day pertaining to dugongs, seagrasses, associated fauna, traditional ecological knowledge, CAMPA Dugong project activities, field stories, and gratitude posts for field assistants. Every post is intended to foster a holistic awareness of dugongs and the conservation efforts amongst the public. The team was always inspired to come up with new and improved ways to connect with people by the overwhelming responses to the posts. We were more inventive as a result of the positive response to online campaigns like competitions. For instance, the painting competition encompassed other materials, including glass and clothing, in addition to painting on paper. Memes are a popular kind of humour that has gained significant traction on social media in recent years. This year's meme competition highlighted this trend with the theme "Marine life and conservation."

Uniting the scientific experts on dugongs and seagrasses holds equal importance to raising awareness among the general public. Webinars greatly facilitate scientific collaboration and knowledge transfer. Scientists, geographically separated, can connect virtually as a result, eliminating the need for physical presence. This inclusivity encourages diversity and enables researchers to engage with a wide spectrum of experts, fostering a global scientific community. Dr Helene Marsh, an eminent dugong expert from James Cook University in Australia, gave a keynote address on "Impacts of Climate Change on Dugongs and seagrasses" on World Dugong Day this year. The main topics of the talk included potential concerns driven by climate change conditions and a discussion of an action plan to address issues with dugong conservation. A panel of international dugong experts from Australia, India, Sri Lanka, Indonesia, and Thailand was set to learn more about dugong conservation in South and Southeast Asia. The experts had conversations about conservation concerns in their respective countries and the collective solutions to be implemented. These scientific discussions broadened our perspectives and enlightened us on alternative approaches, all of which are for better science and conservation!

Celebration of days like world dugong day serves several purposes, including raising awareness, promoting conservation efforts, and highlighting the significance of a specific species. In 2023, the World Dugong Day celebration helped us reach various organisations and individuals worldwide through virtual platforms, talking about the importance of dugongs and seagrasses. These celebrations will help us to achieve the bigger goal of advocating for policy changes and legislative actions to protect the species. Within the boundless world of the digital landscape lies the immense potential for dugong conservation, fortified by on-the-ground research, conservation efforts, and stakeholder engagement by the CAMPA dugong team. Integrating social media with comprehensive conservation strategies will enhance public endorsement, mobilise action, and contribute towards the long-term conservation of dugongs and their habitats.

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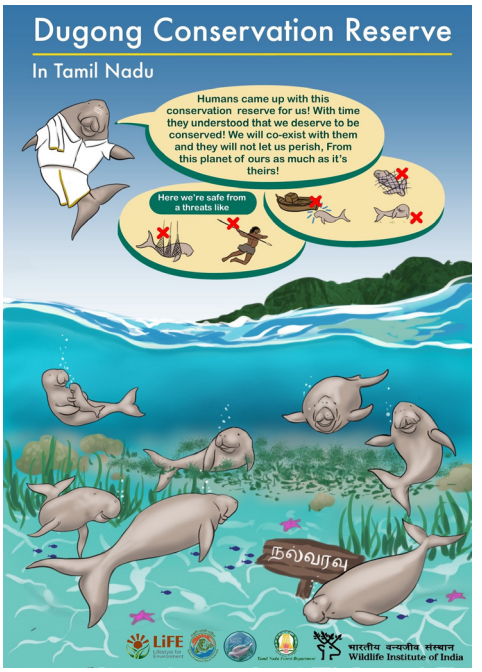
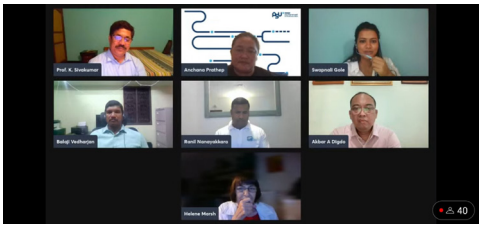
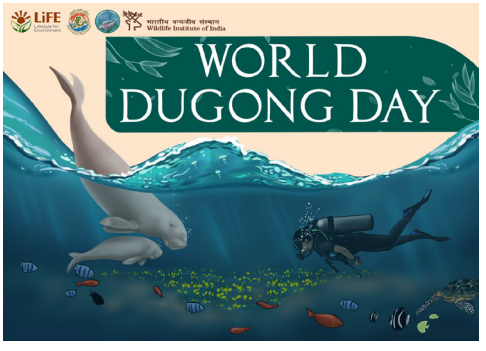
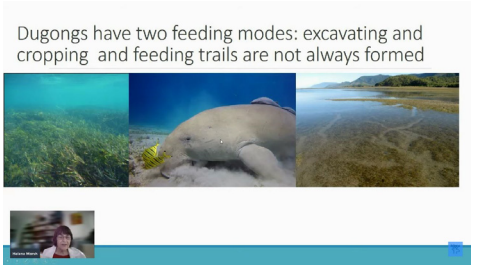


# Lepidopterans: Masters of Deception

*- Manas Shukla*

Ever since childhood, our minds have been conditioned to associate the thought of butterflies with emotions of peace, harmlessness and beauty. It's not a rare sight to find those iridescent hues wandering amidst flowering bushes as if they are attending a wine-tasting party. What could they possibly bring to one's mind if not peace?

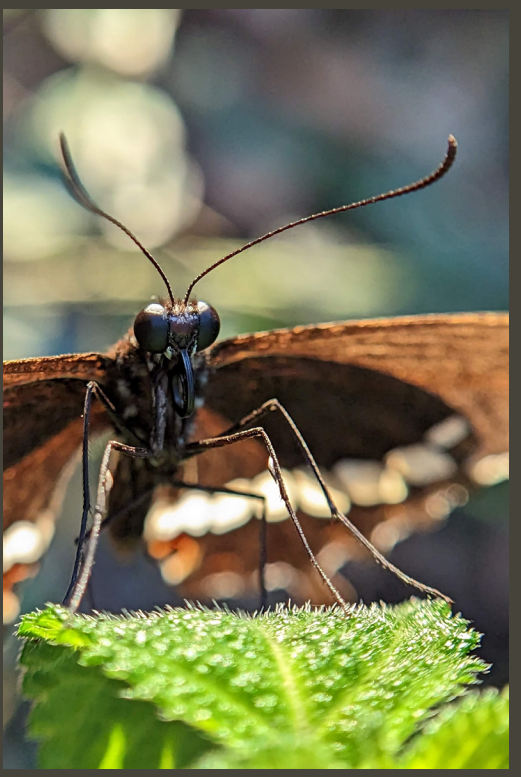
Well, the fact that our fellow Lepidopterans - the members of the Order Lepidoptera, i.e. butterflies and moths - are devoted preachers of deception much more than peace may be surprising to some but definitely closer to truth.

The illusion that "butterflies are beautiful insects who feed on tasty nectar of pretty flowers" may have been broken for those who have spotted butterflies dancing around animal carcasses, with their proboscis half dipped in blood and urine, quenching their thirst for sodium and amino acids. But still, there is more to them.

One of the major characteristics that make them deceitful is their colour. The Morpho menelaus is quite an aesthetically pleasing blue-hued butterfly to the human eye (beautiful enough to represent the butterfly emoji). But despite showing off the most vibrant shades of blue, these butterflies are technically not blue at all. The presence of a certain pigment doesn't embed the blue colour of this species but rather is an intriguing result of the dance of light waves against the shape of their wing scales. The wing scales of the Morpho menelaus are constructed of microscopic ridge-like structures of varying depth. When light hits the scale surface, some waves bounce off the top ridges, while some get absorbed and reflected off the bottom ridges. This creates light of two different phases, eventually cancelling each other. Almost all wavelengths of light fall prey to this intricate design, except blue. The wavelength of blue light falls just in the right range, which can reflect off the wing scales' surface with rays being completely in sync instead of phasing out and eventually getting removed like other colours, ultimately hitting our retina, forming a beautiful blue shade. For ease of understanding, one can compare this to the fact that the colour yellow on our screens isn't actually yellow, but thousands of red, green and blue pixels distributed perfectly enough to form that shade of yellow.

The variety of shades exhibited by different butterfly and moth species are developed evolutionary mechanisms not to appear attractive, but the polar opposite of that. Lepidopterans use colours for a number of purposes - for camouflage, like *Kallima inachus* (Orange Oakleaf), for scaring away predators by pretending to look like other higher predators, like *Caligus sp.* (Forest giant owl), and even to simply warn or bluff that they are poisonous, like *Papilio sp.* (Swallowtail). It would be no surprise that if humans had been a threat to butterflies, after a sufficient period of time, lepidopterans would gain enough evolutionary points to deceive us Homo sapiens too. Maybe in that alternate reality, butterflies and moths would appear in horror stories being read to children at night to make them fall asleep.

Their deception doesn't end there. Pheromone release is a major characteristic of these beings, which impacts their mating decisions. Males release pheromones to attract females, shouting "love is in the air" out loud. Many lepidopterans also tend to engage in "lekking"- a lepidopteran festival in which the males gather in groups to show off and attract females by pheromonal and morphological appeal. Many have large coremata, which are hairy tentacles protruding from their lower abdomens, sometimes even larger than their wings. On first look, it would be a normal human reaction to hold your head and yell in horror. Organs like coremata and androconia scales help in releasing pheromones effectively, and to a female, a more appealing male would mean better defence against predators and, therefore, safer offspring.



*Swallowtail Mormon © By Manas Shukla*

*Baphomet Moth © vinitapuniasangwan iNaturalist*

If one starts digging for enough information about these exceptional creatures, there would be no cease to amazement at how our lepidopterans' qualities range from their thirst for blood to their sense of Earth's magnetic field for their respective migrations. Therefore, it is sufficient to say that these beings have rightfully earned the title of "masters of deception", replacing the generic image we have of them.

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# Megaherbivores Provide Biotic Resistance Against Alien Plant Dominance

*- Mungi NA, Jhala YV, Qureshi Q, le Roux E, Svenning JC (2023)*

A new study "Megaherbivores provide biotic resistance against alien plant dominance" conducted by the Wildlife Institute of India was published in Nature ecology and evolution. It highlights several benefits of conserving megaherbivores (herbivores achieving body mass >1000 kg) in India. While the role of megaherbivores in shaping vegetation systems, biogeochemical cycles, fire control, and biodiversity has been well-studied in parts of Africa, their role in Indian context has been less explored. This study underscores the impacts of these ecosystem engineers, which have become increasingly crucial in the face of mounting ecosystem degradation driven by human activities, climatic changes, and biological invasions.

The research investigated intricate relationships between megaherbivores, native plants, and invasive plants. It embarked on the world record biodiversity data generated by All India Tiger Monitoring Program, encompassing over 26,000 camera traps, 34 million photographs, and 158,000 vegetation plots, from across 12 biomes in India. By accounting the impacts of environmental variables like climate, human disturbance, fire, floods, and vegetation type, the study consistently revealed a positive correlation between megaherbivores and higher cover and richness of native plants across all biomes. The relationship with invasive plants was relatively complex. By virtue of their large size, broader dietary spectrum, and higher densities, megaherbivores remove large vegetation biomass including invasive plants from the system and generate space for new plant growth. These niches are exploited by both native and invasive plants. In mid-productive systems like floodplain grasslands, savannas, and seasonally moist forests (e.g., Kaziranga, Manas, Valmiki, Dudhwa), megaherbivores reduced invasive plants cover. Conversely, in low-productive dry savannas and forests dominated (>40%) by woody thicket-forming invasive plants (e.g., Bandipur, Mudumalai, Sathyamangalam), megaherbivores were linked with increased invasion cover. Megaherbivores are also seen explicitly feeding on native plants in these regions, which compounds the pressure on native plants that are already depleted by competition from invasive plants. These areas urgently need invasive plant management and restoration of natural disturbance regimes that periodically remove woody invasive plants, so that the positive role of megaherbivores could be harnessed.

Nonetheless, megaherbivores ubiquitously restored native plants across all biomes, accentuating their role as nature-based solution for reducing dominance of invasive plants, while simultaneously restoring native plant diversity — a service that was unacknowledged until this study. The findings add yet another reason for conserving and recovering megaherbivores across their historical range. Not least, considering the accelerating invasions in India, with nearly 66% natural areas threatened by plant invasions.

The study was a collaborative effort by the Wildlife Institute of India, National Tiger Conservation Authority, and Aarhus University in Denmark.

Source: Mungi NA, Jhala YV, Qureshi Q, le Roux E, Svenning JC (2023) Megaherbivores provide biotic resistance against alien plant dominance. Nature ecology& evolution

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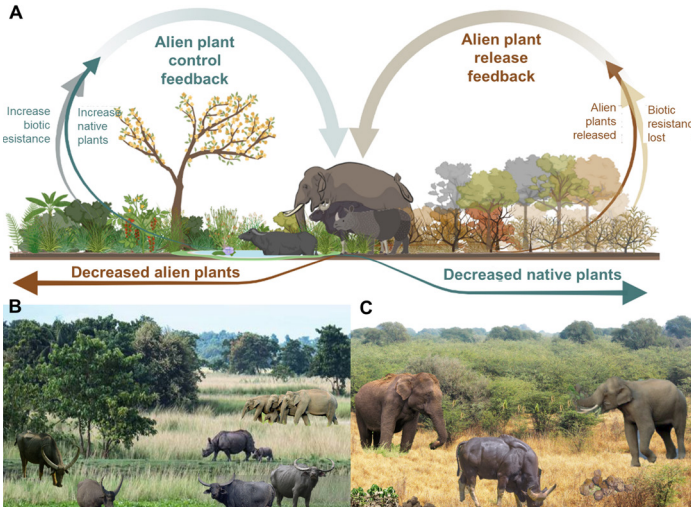


# Exploring the Churdhar Wildlife Sanctuary: A Hidden Gem in the Himalayas

*- Nidhi Singh & Saurav Chaudhary*

Located in the Sirmaur district of Himachal Pradesh, Churdhar WLS lies at a distance of ~110 km from Shimla. It was declared a Wildlife Sanctuary under the Wildlife Protection Act (WPA 1972) in 1985 and currently spans an area of 55.52 km2. The sanctuary was established to conserve the endangered Himalayan musk deer, also known as kasturi.

The musk deer, a ruminant species, is not an actual deer and is characterised by the absence of antlers. Males have significantly developed canines, while females have shorter ones. The Himalayan musk deer, the state animal of Uttarakhand, is found across the Indian Himalayan Region and prefers alpine scrub and subalpine forest habitats.

The sanctuary is divided into four forest divisions, namely Chauras, Chogtali, Nohra, and Pulwal. The region's vegetation is dominated by Himalayan Moist Temperate forests, primarily composed of oak forests mixed with coniferous trees such as spruce, silver fir, blue pine, and chir pine. Birch trees are found in a few patches in some parts of the sanctuary. Scrubs of rhododendrons and junipers are also present throughout the forest. Himalayan temperate pastures are scattered on the steep and exposed slopes, where herder communities graze their livestock. In addition, small patches of alpine meadows can be seen along the Crestline.

Churdhar Wildlife Sanctuary is home to the "Churdhar temple," a temple devoted to Lord Shiva. Located near Chur peak at an altitude of approximately 3600 meters, the temple is known as the Shirgul Mahadev temple. As legend has it, a descendant of Lord Shiva, Lord Shirgul, established the temple at the peak. The region is mainly flooded with tourists and pilgrims between May and September, with an average of 400 people visiting the area daily, which subsequently increases during holidays.

In October 2021, our team arrived in Nohradhar, Himachal Pradesh, a small town on the outskirts of Churdhar Wildlife Sanctuary. It was the perfect location to set up a basecamp as we aimed to explore the sanctuary, which was the focus of our biodiversity assessment research project.

Numerous studies have shown that camera traps are an effective tool for monitoring animals in tropical and temperate forests, where it is incredibly challenging to record mammals. Many of these animals are elusive and nocturnal, prefer dense vegetation, occur in low abundance, and avoid human presence. Camera traps are also the most convenient devices to study these mammals without disturbing their natural habitat. In winter 2021, we deployed the camera traps in the sanctuary. In our camera traps, we recorded various mammals, from top carnivores like the common leopard and Asiatic black bear to ungulates like barking deer and Himalayan goral.

On the trails that we walked, we found many signs of animals in the form of pugmarks and faecal material of leopards and bears, pellets of deer, and quills of porcupines. On multiple occasions, we even saw a red fox, Royle's pika, yellow-throated marten, red giant flying squirrel, masked palm civet, Himalayan langur, and rhesus macaque.

Our team was excited to spot a Himalayan musk deer in the sanctuary, as none of us had seen one in the wild before, only in captivity. Unfortunately, we didn't have a direct sighting of the species. During informal conversations with locals over meals, we learned that musk deer are present in the sanctuary. One shop owner mentioned that migratory herders often report Kasturi (musk deer) sightings near their herds.
The Churdhar Wildlife Sanctuary is a treasure trove of biodiversity, boasting a stunning range of flora and fauna that make it a natural wonder. From the magnificent Himalayan oak forests to rare and endangered species like the musk deer, and a unique assemblage of various herpetofauna, this sanctuary is a testament to the incredible diversity of life found in India's wilderness.

The sanctuary provides a habitat for wildlife and serves as a source of livelihood for the local communities. Our responsibility is to protect and preserve this magnificent ecosystem for the present generation and the future.

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# 30 days in Sunderban Tiger Reserve

*- Panchali Hazarika*

*"The wildlife and its habitat cannot speak, so we must and we will."*
~ Theodore Roosevelt.

We arrived at the entrance of the Sunderban Tiger Reserve on 1 February 2023, and the realisation dawned on us that this survey would be different. The first thing I did was get a good picture of mine with the entry gate 'Thank you and Visit again, Sunderban Tiger Reserve'. I stood at the wrong side, and it was too late to click again. Anyways, our home for the next 30 days arrived at the bank, and my opinion of the M.V. Bishalaxmi much improved when I saw there were actual beds with tiny windows next to them and two western toilet systems. A luxury indeed, the friendly boat crew welcomed us with a homely Bengali meal. Thus, we began preparing for the survey of the wide estimation of the River Dolphin at the Sunderban Tiger Reserve, the largest delta in the world.

The survey commenced successfully on 2 February, and we were all enthralled by the unique landscape and breathtaking views of the sun gliding through Mangroves. The pneumatophores protruded gracefully from the swampy river banks with dense forests wide awake with birds, animals, and insects. We were lucky to encounter the humongous estuarine crocodiles and the Irrawaddy dolphins but equally disheartened not to spot a Royal Bengal Tiger.

We were cautioned about the phenomenon of low tides-high tides, and as carefully we arranged the survey timings and routes, things wouldn't always go as planned. We experienced the first low tide during the survey on the seventh day. The transition from a flowing river with a 5m depth to a naked river bed was so smooth that we were too astonished to react in time. I couldn't even collect my plankton sample; all it collected was mud. But we did take advantage of the unexpected survey break and watched the MMA fight between two mud skippers, which was well interrupted by the sight of a small herd of Chital on the bank (I was rude enough to imagine a tiger jumping right in for its evening catch, but gladly, was disappointed). In the evening, at around 7 p.m., water filled in slowly and as the channel was reborn again, we ignited the engine and hurriedly moved to a safer zone. Another incident happened on the 18th day at 2 a.m. The team was sleeping as logs when suddenly, I heard the boatmen talking and rushing to the engine room. Abruptly, the engine roared, except I was thankful that the sound of the engine masked the terrifying snores. We suddenly felt the boat tilt on no side and soon realised what had happened- a low tide caused our boat to incline on a deadly slope of the river bed. It was frightening as the situation was unpredictable, but after a tiring struggle till 2:30 a.m., our boat crew successfully saved the boat and the terrified researchers of WII.

Cruising amidst the dense forests of Sunderban on a full moon night was a time of pure tranquillity. On one such night, when the boat halted for the night near the Bay of Bengal, we got to witness one of nature's incredible creations- bioluminescent plankton. These are dinoflagellates, which contain the enzyme luciferase that catalyses certain chemicals called luciferins, and upon reactions with oxygen, they vibrate and cause luminescence. The plankton net glowed in absolute glory. All that couldn't be captured in any camera but was forever embedded in our memories.

I think Goddess Bon Bibi blessed us throughout the survey. We had stopped at her shrine at one of the forest beat camps; her legend is worth knowing. She is known to have her protective shield over the mangroves of Sunderban. The beautiful legend of Bon Bibi claims that Hindus and Muslims worship her for her bravery and kindness across the region.

We completed 958 km in 30 days and returned to the same gate where I took my picture on the wrong side. It was nostalgic and fruitful, a learning experience in many aspects. We all waved the boat crew goodbye and goodbye to the Sunderban Tiger Reserve.

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# Kentish Plovers using Horse's Hoof Prints–A Case of Commensalism or just a Random Tactic to Avoid Predation?

*- Praveen Kumar*

Kentish Plovers, also known as *Charadrius alexandrinus*, are small shorebirds that belong to the family of plovers, Charadriidae. They are found across various habitats, including sandy beaches, mudflats, and saltpans. These birds are known for their distinctive white forehand bands across their necks and chests, making them easy to spot among other plover species. Kentish Plovers are known to be a resident breeder and winter visitor to India. According to the IUCN Red List of Threatened Species, Kentish Plovers are categorised as "Least Concern" in India. However, this does not indicate that the species is free from threats and conservation concerns in the country. The primary threats to Kentish Plovers in India are habitat degradation, fragmentation and loss due to coastal development, tourism and urbanisation. Additionally, the presence of feral dogs and cats, which prey on eggs and chicks, can pose a significant threat to the survival of this species.

Amazingly, this majestic species might have developed useful tactics to roost safely along the beaches. This thought came after a casual observation during field surveys on the northern coastline of the Gulf of Kachchh during the wintering period of 2021-2022. The author noted that Kentish Plovers used hoof prints made by a passing horse near a recreational beach to rest safely along the shoreline. It appeared as if the pit in the sand created by the hoof prints was sufficient to hide these tiny-sized (Approx. 15-17 cm) shorebirds. Two thoughts cross the mind while looking for plausible answers for the observed behaviour. First, is the observed phenomenon a case of proven commensalism? Second, is it just a random tactic used by the Kentish Plovers to protect themselves from predators like feral dogs? In the narrow sense, commensalism can be understood as an interaction strictly neutral for one organism and positive for the other. Therefore, in the observation as mentioned above, the exchange seemed neutral for the horse as he might not have had the slightest clue that his hoof prints would be used later by some organism, whereas the Kentish Plovers seemed to benefit positively from the hoof prints made by the horse. As fascinating as it may seem, this observation warrants further investigation to better understand the unique behaviour displayed by the Kentish Plovers.

This largely understudied subset of organismal interaction represents a significant opportunity to investigate evolutionary processes in a rapidly changing environment (Hulme-Beaman et al., 2016). Commensalism within anthropogenic habitats has not been extensively described and discussed despite its impact on the ecological balance of the concerned area (Hulme-Beaman et al., 2016). Therefore, this gives young wildlife researchers and other natural science enthusiasts an astounding opportunity to conduct systematic studies to understand this understudied behaviour and reach some convincing outlook. Moreover, regarding coastal wildlife conservation, including Kentish Plovers, the Indian government has implemented several conservation measures to protect the species and their habitats. One such measure is the Coastal Regulation Zone (CRZ) Notification, which regulates the use of land and water resources in the coastal zone, including restrictions on the construction of buildings and other infrastructures on the beaches and sandspits. Despite these efforts, there is still a need for strengthening the conservation efforts to safeguard Kentish Plovers and their habitats in India. Continuous monitoring of their populations and habitats along with appropriate management practices and awareness among the people are crucial for the long-term survival of this species in the country.

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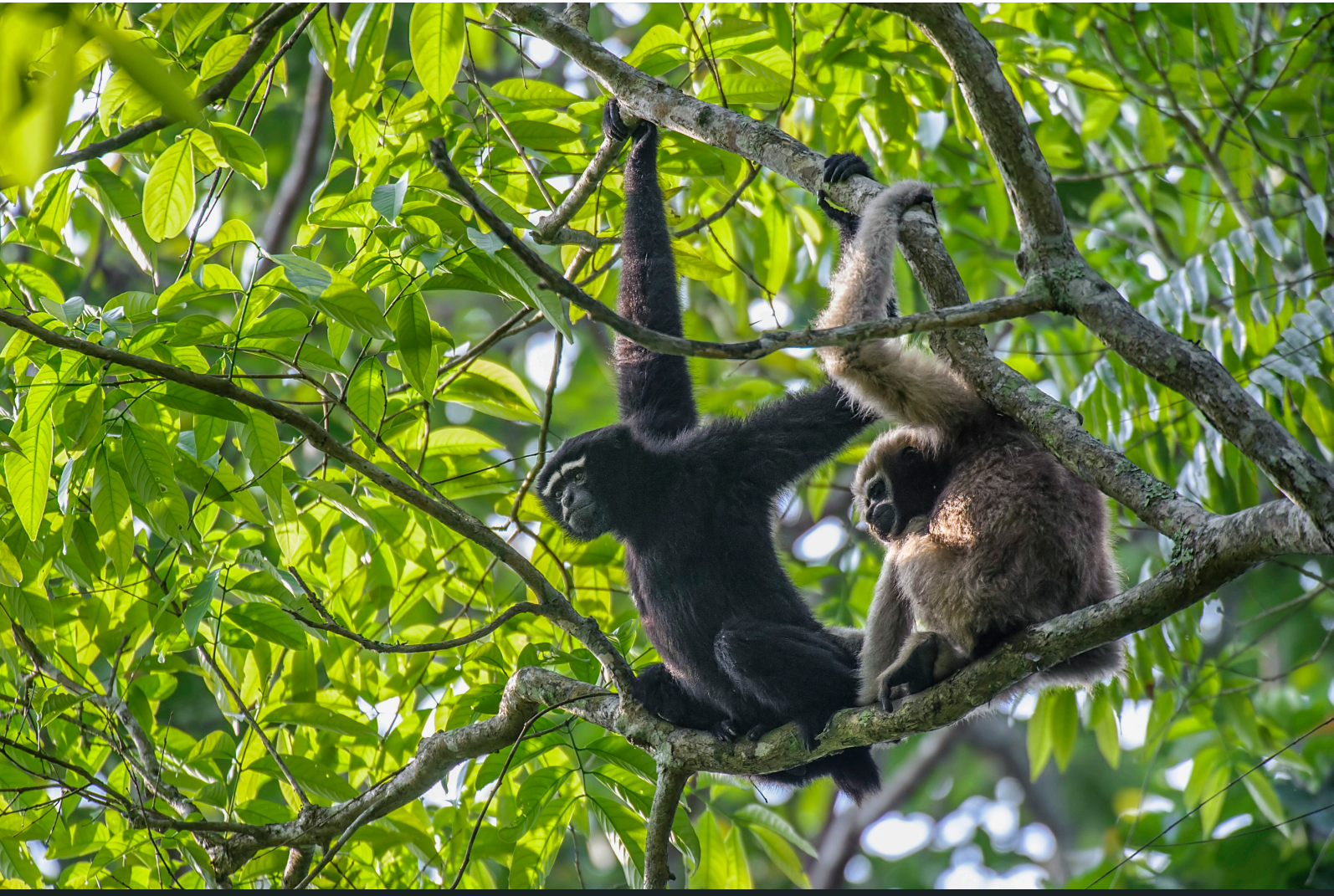

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# Cornered & Broken - Hollongapar Gibbon Sanctuary is a Litmus Test for India's Conservation Philosophy

*Rohit R.S. Jha and G.V. Gopi*

It is the early hours of a chilly November morning. The morning mist has given way to reveal the breathtaking beauty of Hollongapar Gibbon Sanctuary's forests. Towering trees, some reaching 150 feet in height, create a dense canopy in this semi-evergreen forest in eastern Assam's Jorhat district. The forest floor is a tapestry of fallen leaves, twigs, and branches, while the understorey flourishes with vibrant growth of herbs, shrubs, ferns and saplings.

The Hollongapar Gibbon Sanctuary derives its name from the Hollong Dipterocarpus macrocarpus tree, which is also Assam's state tree. It is the only Protected Area (PA) in the country named after a primate species, the western hoolock gibbon Hoolock hoolock. As we walk along the railway track, traverse through the sanctuary and divide it into two unequal habitat fragments, the loud and conspicuous songs of the w. h. gibbon- India's only ape species — resonate and reverberate through the air. The gibbon's crescendo of a song consisting of whoops, hoots, and whistles strung in harmonious ways for specific purposes — such as territoriality and maintaining group cohesion — is a fascinating case of acoustic sophistication and versatility in primate communication, piquing the curiosity of researchers studying human speech evolution. Around 125 w. h. gibbons inhabit the Hollongapar Gibbon Sanctuary, harbouring significant species- and subpopulation-level genetic diversity.

The w. h. gibbon is an exclusively arboreal primate, relying on tall, closed-canopy continuous stretches of forests for its survival. In India, a maximum of 10,000 w. h. gibbon exists in small, insular populations across the northeastern states, restricted to the south and east of the Brahmaputra and Dibang rivers, respectively. A population of around 500 resides in Bangladesh, while estimates from its only other range country, Myanmar, are not known. The gibbons form monogamous family groups consisting of related individuals around the breeding pair. They primarily use the 'brachiation' mode of locomotion (swinging by arms/forelimbs only) to acrobatically swing through the forest's middle and upper canopies. Dwindling numbers, primarily due to habitat loss, habitat degradation and hunting, have led them to be classified as Endangered in the International Union for Conservation of Nature's (IUCN) Red List. Although the w. h. gibbon has been given the highest legislative protection in our country by way of its inclusion in Schedule I of the Wild Life (Protection) Act 1972. Neither countrywide reliable population estimates nor range-wide species recovery/ conservation action plans are available.

Initially set aside as the Hollongapar Reserved Forest (RF) by the then-British colonial government in 1881 under the Indian Forest Act of 1878, it covered only about 2.06 sq km but was part of the much larger and well-integrated forested landscape of the Patkai Range. The subsequent establishment of tea gardens and human settlements during 1880-1920 severed the forest's connection totally, further worsened by a railway line — as yet single track, un-electrified on which at least 12 pairs of passenger and cargo trains ply as of today — operationalised in 1887 that created a significant break in canopy and isolated gibbon groups on either side. Efforts to consolidate the remaining forested areas in and around Hollongapar RF led to its declaration as a PA — 'Gibbon Sanctuary' — in 1997 by the Assam State government under the Wild Life (Protection) Act, 1972, with a total area of 20.98 sq km. In the year 2004, the PA was renamed the 'Hollongapar Gibbon

Sanctuary'. However, since then, approximately three sq km have been leased to the Indian Army's Military Engineering Services (MES), reducing the relatively small PA's effective size to about 18 sq km.

Situated at an elevation of 100-120 m above mean sea level, the Hollongapar Gibbon Sanctuary falls under the globally recognised 'Indo-Burma Biodiversity Hotspot'. It is located in India's Northeast biogeographic zone (9) within the Northeast Brahmaputra Valley biogeographic province (9A). The sanctuary receives an average rainfall of about 2490 mm while the average temperature ranges between 5°C to 38°C. The forest type in the sanctuary is 'Tropical Semi-Evergreen' with the subtype 'Assam Plains Alluvial Semi-Evergreen' (2B/C1a) harbouring patches of wet evergreen forests. The major watercourse of the sanctuary is one of the tributaries of Brahmaputra called Bhogdoi River, flowing in the general southeast to northwest direction.

Including the flagship w. h. gibbon, the sanctuary also harbours a great diversity of primates, including the Bengal slow loris *Nycticebus bengalensis* — northeastern India's only nocturnal primate, stump-tailed macaque *Macaca arctoides*, northern pig-tailed macaque *M. leonine*, eastern Assamese macaque *M. assamensis* (considered locally extinct since 2005), rhesus macaque *M. mulatta* and capped langur *Trachypithecus pileatus*. Other arboreal mammals include the Malayan giant squirrel *Ratufa bicolor* and the particoloured flying squirrel *Hylopetes alboniger*. Apart from the Hollong tree, other important tree species in the sanctuary from the perspective of arboreal animals include Sam kothal *Artocarpus chama*, Pan sopa *Michelia montana*, Phul hingori *Castonopsis indica*, Ajhar *Lagerstroemia speciose*, Kenglo *Trewia nudiflora*, Otenga *Dillenia indica* etc. The sanctuary hosts diverse vertebrate and invertebrate life, with over 200 butterfly species, 95 spider species, 41 mammalian species, such as Asian elephant *Elephas maximus,* tiger *Panthera tigris*, leopard *P. pardus*, leopard cat *Prionailurus bengalensis*, sambar *Rusa unicolor* (no recent records), barking deer *Muntiacus vaginalis*, wild pig *Sus scrofa*, Chinese porcupine *Hystrix brachyura*, Chinese pangolin *Manis pentadactyla*, and about 250 bird species, including Assam's State bird the Endangered White-winged Duck *Asarcornis scutulata.*

Despite its small size, the sanctuary houses a remarkable range of flora and fauna. It is not only an Indian PA but also globally recognised as an Important Bird and Biodiversity Area (IBA) and Key Biodiversity Area (KBA). Although threats like habitat degradation, encroachment, hunting, increasing human-elephant conflict, and the sanctuary's lack of connectivity with surrounding forest patches persist and are being gradually tackled by the under-staffed Forest Department with civil society and NGO involvement, the existential threat imposed by the railway infrastructure and its impending electrification and expansion plans might prove to be the proverbial death knell for the sanctuary, especially for its arboreal flagship fauna such as w. h. gibbon and Bengal slow loris.

While installing canopy bridges will help in the interim to facilitate gibbon movements — and efforts in that direction by the Assam Forest Department in association with WII are ongoing — moving the relatively short 1.65-km track itself from within the sanctuary to available non-forest areas outside would be a critical and bold step towards restoring its integrity. The fate of the w. h. gibbon within Hollongapar Gibbon Sanctuary is set to test India's conservation philosophy and the quest to make the economy compatible with ecology. The choices made will indicate the nation's conservation journey in the future.

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# Express "Ways" to Lose a Forest

*- Umama Khan*

The first time I travelled to Dehradun was in the monsoon season of 2014, and what better time to visit Doon Valley than in the rainy season? The monsoon pushes the overall lush greenery of the valley to its maximum potential. Every inch of the forest ground and ruins turns into soothing green, the best shade of the colour green. At that time, the bus from Kashmere gate (Delhi) would take six hours to reach Doon Valley. During its journey, the bus would pass through the hustle-bustle of major cities for the first five hours. But the 'last hour' left me in awe with it. Those five hectic hours would lead you into the final 'stupefy' or mesmerising hour. The green forest with contrasting blue sky in the background captivated the attention of a metro-city dweller who forgot that the colour of the sky was supposed to be bright blue instead of a hazy grey. What a sad thing to say, but just enough to realise our world's reality, heading towards a grey future.

In the last part of the journey, the bus covers a 35 km long stretch from Biharigarh to Dehradun. As we leave from Biharigarh, we enter Mohand, which leads into a two-lane narrow road that would take us into the Siwalik mountains (foothills of the Himalayas). Though not mighty, these hills appear out of nowhere, bearing the weight of outlandish (Mixed-)Sal forests. The seasonal rivulets flow along the mountains and the narrow road. The no-network zone gives you enough reasons to keep your phone aside and let nature bring you joy; your phone could never.

As we traversed further into the mountains, we passed through the famous Daat Kali Mandir, and the bus drivers would stop for a moment to take her blessings so that the mountain curves would go easy on us. Then came a pitch-black tunnel that opened to the best part of that journey. With Rajaji National Park on the right and Siwalik Hills on the left, I felt I could breathe better just by looking at the flourishing landscape. The mighty Sal Forest (30m tall) on both sides of the road stands tall and erect as far as one can see. It seems like the forest opens a secret passage for you to pass through. Even the sunlight wouldn't dare to breach the canopy of the magnificent Sal.


*The magnificent Doon Sal forests (growing about 90 feet or more)*

The best part of being in Doon is no matter where you stand amidst the sleepy city; every road will lead you towards the forests. The beautiful Doon Valley lies between two fitful ranges of the Himalayas, the Lesser Himalayas (Mussoorie Range) and the Outer Himalayas (Siwalik Hills). Originating from the hills or rain-fed, several streams and rivers (Song, Tons, Asan, Jakhan, Suswa and Rispana) pass through the valley. The mighty Yamuna forms the western border, whereas the sacred River Ganga marks the valley's eastern edge. Rajaji National Park, on the city's outskirts, is home to Wild Elephants, tigers, leopards, wild boars, 400 species of birds, civets, barking deer and most importantly, the gregarious Sal forests.

The forest ranges in and around Doon Valley are majorly composed of Sal trees. According to a famous saying in Uttarakhand about Sal trees,

सौ साल खड़ा, सौ साल पड़ा, फरि भी नहीं सड़ा

A Sal tree grows for 100 years, stands for another 100 years, and finally takes 100 years to rot, though they are known to have even longer lifelines. These Herculean forests date back to the British era and give rise to a distinctive ecosystem around themselves. It creates an environment that forms a continuous monotonous forest and fosters everything nearby. Sal, a semi-deciduous tree (sheds not all but a significant share of its leaves during the fall season) with its 'helicopter' seeds (dispersal), is known for its ever-reaching heights, its impregnable dense canopy (termite-resistant Sal community), its durability, timber, socio-economic uses and whatnot. Another famous thing about Sal is that it cannot be artificially regenerated. No one can grow a Sal tree. It grows only if it wants to (remains a mystery), forcing British foresters to believe that a 'Sal tree dies of loneliness'. Eight forest ranges (Sal forests, mixed-Sal forests) surround the Doon Valley, each working as an individual ecosystem, a wildlife corridor connecting one national park to another, bringing down the city's temperature, keeping a check on rising pollution levels, providing fresh air to its residents and finally bringing ample amount of rainfall to the valley.


*Human trails inside Forest ranges in Doon Valley (Umama Khan)*

Cut to 2023; it's been almost a decade since I first travelled to this valley. I was recently travelling back home after a long gap. As soon as I crossed the last check-post (of Doon), very excited, I started preparing myself for my secret-heavenly passageway. I pulled out my headphones, plugged them into my ears and chose a soothing instrumental piece to match the vibe of my peaceful greens. To my dismay, I saw countless dead stumps of Sal and many more tree shrubs lying along the edge of the road. The mountains were blown in half; the forest pushed half a km into its boundary. The cranes and heavy machinery could breach what even sunlight couldn't. I sat stunned at the sight, unable to process my 'paid-window' view. For 5 minutes, I kept looking at the devastating view until I thought it was better to look away and why not? Humans are great at neglecting and ignoring the devastation we bring to nature and everything associated.

The government and authorities have approved a 4-lane Delhi-Dehradun elevated Expressway. 2500 (and more) British-era Sal and other tree species were chopped down to meet the needs of the expressway. It connects from Akshardham Delhi to the Doon check-post. The 13,000-crore elevated road project promises to reduce travel time from 6 to 2.5 hours. It doesn't promise you fresh air. I will not lie; the journey is no more hectic and has pros. It is just that sometimes, we need to weigh the outcomes of our decisions. It's good to be optimistic about our projects/plans, but at what cost? At the cost of our dwindling resources? At the cost of raw materials and innumerable services they provide? At the cost of our wild flora and fauna? At the cost of OXYGEN and WATER? After all, our greed has no end. The four-lane greed and need will soon want an 8-lane road and maybe more because the reality is that India has surpassed China to be the most populated country in the world. To meet the needs of 1.4 billion people, more and more forested land will be converted to agriculture, industries, and sometimes a 4-lane elevated Expressway. Uttarakhand has already lost 25,000 to different "development" projects. We need to understand that forests are not in our way towards development. Our ever-increasing population is.

Adjoining fringe forests stand guard to the more valuable core forests and the resources they hold within. Communities depend on the fringe forest for resources (fuel, fodder, food, grazing), and as front-liners, they bear the load of heavy intrusion, destruction, damage and exploitation. But the over-exploitation is to such an extent that the yield from these fringe forests is not enough to meet our daily and local needs. It is endangering the precious interior forests and affecting the overall potential they hold and the ecological services they provide. Woods might be considered a renewable resource, but Sal-forests cannot be regenerated and thus shouldn't be considered an endlessly renewable resource. Any resource can be termed as 'RENEWABLE' only if it has ample time and space to flourish and enough protection laws to safeguard its integrity.

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*The adjoining marginalised communities utilising forest resources (Umama Khan)*

# The Traditional Fire Burning Festival of Teressa Island: An Unheard Tale of Bringing New Life to the Island

*- Dhanesh Ponnu, Jyoti Nagarkoti, Chinnasamy Ramesh*

As part of the project entitled "Conservation Ecology of the Endangered Reticulated Python *Malayopython reticulatus* (Schneider 1801), in the Nicobar Archipelago, India, we had a remarkable opportunity to visit Teressa Island, where we witnessed a traditional festival that embodies the island's rich cultural heritage, an integral part of the exquisite Nicobar Archipelago. Our visit spanned ten days on the island from 28 April to 8 May 2023.

During our stay, we had the distinct privilege to witness a customary festival that unfolds within the unique social fabric of the island. A fascinating feature of this event is the synchronised burning of vast grasslands in each Basti, referring to the local villages, on chosen days. This significant event, steeped in tradition, is scheduled based on lunar phases, emphasising the islanders' profound connection to nature's rhythms.

The pinnacle of this festive occasion is marked by an elaborate feast, uniting islanders, officials, settlers, and visitors from neighbouring islands. After the tsunami, they have partially lost most of their indigenous food habits, like eating pandanus, and maggots. However, they still have managed to harmonise with the new food items. Notably, the culinary offerings presented during this grand occasion reflect the islanders' openness to embracing new savoury experiences. Traditional staples like pork, chicken, fish, and eggs harmoniously coexist with more exotic fare, including biriyani, rice, roti, poori, and dal, as well as indigenous delights such as wild tubers like Nicobari aloo, boiled banana, sweets made out of pandanus fruit, and pineapple, and meetha bhaji meaning sweet leaves which are collected from the forest.

It is remarkable how the festive spirit extends beyond culinary delights. The Nicobarese also hunt wild pigs and reticulated pythons, a practice not typically observed among the people on the islands, particularly for the latter animal, as these animals emerge from hidden places to save themselves from the fire when the grassland burning event begins. They usually hunt wild pigs, while the reticulated python, the giant animal on the island, was never actively pursued other than the instances of retaliatory killing.

Traditionally associated with nurturing new grass shoots, the Fire Festival was significant for the islanders. During our stay, we observed the start of the Southwest monsoon, which locals believe can be encouraged by burning grass. This led to lush green grass growth on the islands. These resilient shoots would grow to form the vital thatching material for their traditional huts, typically located near the seashore. Additionally, the grass blades served a purpose as sustenance for the island's livestock, including goats, pigs, and cows. Remarkably, with proper maintenance, these meticulously crafted grass roofs could endure for up to four decades, as attested by the islanders. However, the catastrophic impact of the 2004 tsunami reshaped their way of life dramatically. This natural disaster obliterated their huts and resulted in substantial loss of life. In the aftermath, the community was compelled to relocate farther inland, seeking refuge in shelters provided by official authorities. This shift altered their living arrangements, transforming their dispersed dwelling pattern into a close-knit village structure where houses stand nearby.

As a poignant symbol of their unbroken ties to heritage and their ability to adapt, the fire festival endures as a cultural tradition. While the primary purpose of igniting the grasslands has shifted, this annual event remains a powerful uniting force for the island inhabitants. It allows them to congregate, share experiences, and reinforce their collective identity. Moreover, the festival has evolved to accommodate changing circumstances, serving as a platform for community engagement. Stalls are decorated with tender coconut leaves, showcasing traditional handicrafts such as pandanus mats, coconut oil, coconuts, pineapples, indigenous cots, pig cages, and other items emblematic of their culture. This commercial aspect upholds cultural traditions and nurtures economic prospects within the community, diverging from the practised barter system. It is also noted that this custom of burning grasses is only celebrated in Teressa and adjacent Bombuka islands, as these are the only islands with vast grasslands and have remained less connected with other islands for a long time. Scientifically, the ritual aids grassland maintenance, which necessitates a study of its ecological impact on species, including potential negatives.

The Fire Festival's transformation underscores the islanders' resilience in adversity and capacity to imbue their heritage with new significance. It is a testament to their enduring connection to their roots, even as they evolve into novel communal and gastronomical dimensions. This annual celebration fosters unity and showcases their creativity and adaptability while preserving the essence of their cultural legacy.

We would also like to express our heartfelt gratitude for the warm hospitality of the islanders towards us, whom we were strangers to, and for the invaluable insights gained during this immersive cultural encounter. We also thank SERB-DST (CRG/2021/005095) for funding support.

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# A Band of Brothers

*- Abhimanyu Madhusudanan*

In the rather tranquil buffer zone of Rajaji National Park, a group of eager batch mates found themselves immersed in a captivating natural spectacle. As they settled on a weathered log, the symphony of bird calls serenaded their ears, harmonizing with the gentle rustling of leaves. Their eyes were drawn to a distant herd of chital, gracefully grazing in the golden grassland that encircled them. Lost in the enchantment of the moment, their reverie was abruptly interrupted by the urgent call of their field guide. His voice carried a mix of excitement and caution as he informed them of the presence of a nearby group of elephants. With bated breath, they listened to his words, learning that this was an all-male group, known to traverse this very path on their way to the river, occasionally venturing to raid crops on the opposite bank. Eager to witness this rare encounter, the group settled beneath the protective canopy of Pongamia pinnata trees. Patiently, they awaited the arrival of these majestic creatures, their hearts pounding with anticipation.

Gradually, the group emerged from the depths of the forest. Amongst the males, the smaller individuals engaged in a spirited display of sparring, their tusks interlocking in a dance of dominance. Each clash and push was a testament to their strength and resilience, a ritualistic contest to establish their place within the group's hierarchy. The onlookers marvelled at the intricate social dynamics unfolding before their eyes, a glimpse into the behavioural ecology of these pachyderms. As the minutes ticked by, the largest male, adorned with impressive tusks, assumed a position of authority. With a measured stride, he approached the parked vehicles, his eyes scanning the surroundings with a mix of curiosity and caution. It was as if he sought reassurance that no rival bull threatened his reign. Satisfied, he rejoined his companions, and together, they embarked on their journey towards the river, their destination shrouded in mystery. The observers were captivated by the sheer grace and power exuded by these gentle giants. Their immense size and delicate movements painted a vivid portrait of the delicate balance between strength and vulnerability. The landscape itself seemed to bow in reverence to their presence as if acknowledging their role as custodians of this natural realm. As the trio of bulls gradually disappeared into the distance, their silhouettes blending seamlessly with the horizon, the onlookers were left with a profound sense of awe and gratitude. They had been granted a fleeting glimpse into a world rarely witnessed, a tapestry woven with the threads of scenic beauty and the intricate behavioural patterns of the elephants.

# Farewell

**Smt. Shanti Devi Uniyal**
**MTS**
(10 October 2016 - 31 July 2023)

**Thank you for your service!**

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