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भारतीय वन्यजीव संस्थान
Wildlife Institute of India

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Photo by Priyanka Justa, DST-Niche Project

Photo by Arnab Chattopadhyay

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DECCAN VOLCANISM, ASTEROIDS, AND DINOSAURS:
DECODING THE COMPLEXITIES OF THE K-T EXTINCTION

Dr. Ashish Jha

An AI generated image showing the hypothetical scenario of an asteroid hitting the Earth while a volcano erupts in the background

Nicolaus Copernicus's idea that the Sun is the centre of the solar system, Charles Darwin's idea of evolution via natural selection, Ignaz Semmelweis's idea of hand sanitation to reduce infections, and Alfred Wegener's idea of continental drift, are common knowledge today. Still, these revolutionary scientific ideas did not gain wide acceptance when they were first proposed. This is true for most ground-breaking scientific ideas. An exception to this would be Luis W. Alvarez's Asteroid impact hypothesis in 1980 which became an instant hit among the masses. However, some in the scientific community have reservations about it to date.

Asteroid impact has been the most widespread explanation among the masses regarding the Dinosaur extinction. The 1996 book 'The Great Dinosaur Extinction Controversy' by Charles Officer and Jake Page discusses how the above idea oversimplifies a complex event. The book narrates the events surrounding the problem at hand - finding the cause of Cretaceous-Tertiary (K-T) extinction, the proposed hypotheses - falling anywhere on a scale of sane to insane, massive media and public interest in favor of one hypothesis over the other, opposing factions within the science world, and remoulding of the original hypotheses to accommodate newer findings.

Through fossil records, it was known that Earth had witnessed five major extinction events (besides several minor extinctions), the most recent being the K-T extinction that occurred around 66 million years ago (mya). Compared to the previous four major extinction events, the K-T extinction garnered the most public and scientific attention as it brought an end to the reign of the majestic Dinosaurs. Several hypotheses were proposed to explain the extinction namely, disease (pandemic), volcanism (volcanic activity releasing massive amounts of carbon dioxide and sulfur dioxide into the atmosphere, causing extreme climate), competition with newly evolving mammals, sea level recession leading to habitat loss, climate change, and spread of angiosperms leading to a famine-like situation for the gymnosperm adapted dinosaurs. Hitherto, most hypotheses proposed a terrestrial cause of the extinction which changed in 1980 when Luis W. Alvarez and co-authors proposed an extra-territorial cause of the extinction - asteroid. This hypothesis was a massive hit in popular culture for its dramatic overtone, a giant fireball gushing toward Earth, a thunderous explosion, Earth-splitting tremors, and debris blanketing the Earth for years. It eventually made it to the cover of Time magazine as such. The impact hypothesis was based on the increased level of iridium, 300 times more than the background level, within a thin layer of clay at the boundary between the Cretaceous and Tertiary ages at a geological site in Italy. Iridium is a rare earth metal but is abundant in asteroids. Thus, Alvarez et al. proposed a giant asteroid (~10 km diameter) smashing onto the earth, releasing a tremendous amount of iridium and wiping Dinosaurs out of existence. Besides iridium, quartz, a silica-based crystal also supports the impact hypothesis. Under normal conditions, quartz would have a smooth crystal structure while under intense pressure, as upon a giant asteroid striking Earth, the crystals would be deformed. Such 'shocked' quartz was reportedly found at multiple K-T layers across the globe.

However, there were several geological findings that the impact hypothesis could not explain.

Fossil records do not point towards an instantaneous extinction, rather, extinction appears to have occurred stepwise over some 400,000 years; dinosaur and other fossils become progressively rarer towards the K-T boundary. To explain the observed extended extinction record, Alvarez et al. replaced the single asteroid with multiple comet impacts over three million years. However, no geological evidence supporting this idea was found. While iridium is indeed found in asteroids, volcanic activities were also shown to release massive amounts of iridium. Similarly, 'shocked' quartz was found associated with Earthquakes and tectonic movements. Impact sites dated to various geological ages were known from across the World; no correlation between the estimated time of impact and the known major five extinctions was found. Thus, there was no precedent of an extraterrestrial object causing mass extinction on Earth.

The opposing faction found the asteroid theory to be based on anecdotal evidence and not conclusive evidence. However, the opposing ideas found little success in convincing the impact enthusiasts. Premier journals such as Science and Nature were more likely to publish papers favouring the impact hypothesis than those opposing it. Media outlets relied on these 'generalist' journals for their source of science news rather than the 'specialist' geological journals which mostly disagreed with the impact hypothesis. The buzz around the impact hypothesis continued and further strengthened when palaeontologists David Raup and Jack Sepkoski in 1984 reported in their analysis in the Proceedings of the National Academy of Sciences, USA that a mass extinction occurred every 26 million years, including the K-T extinction. Soon, researchers started looking for the possible cause of this periodicity - an unseen galactic object (asteroid, planet, or star) in an elliptical orbit that visits Earth every 26 million years, causing asteroid collisions. Within a year the idea was dumped as it was shown that 26-million-year periodicity was a statistical artifact and not real.

The crucial missing part in the asteroid impact hypothesis was the impact site. The proposed 10-km wide asteroid would have caused a 150-200 km wide crater on Earth and the discovery of 'shocked' quartz implied that the impact site should be on land and not the ocean. Among the potential craters, most of which were in North America, the Chicxulub crater was finally agreed upon as the site of the hypothesized impact. The opponents of the impact hypothesis pointed out the discordance between the findings and the expected data. The Chicxulub site had orderly sequences of sediments from pre- and post-collision periods. While the layers corresponding to the post-asteroid period (Paleocene till Pliocene) are expected, layers representing the period before the asteroid impact (late Cretaceous) are anomalous. An asteroid large enough to create a 200 km wide crater would have excavated at least 10 km of the upper crust destroying the uppermost cretaceous layers, thus destroying all the fossil records before the impact event. The opponents of the asteroid impact suggested Chicxulub to be a crater of volcanic origin.

Authors of the book, Charles Officer and Jake Page opine that Alvarez's hypothesis provided a solution to a problem that did not exist. There was no abrupt extinction record, the proposal of a single cataclysmic event to explain the mass extinction was an overreach. They believed that all the geological evidence points toward a period of intensive volcanism. The Deccan traps of India appear prominently in their discourse. Around 66 mya when the Indian plate was drifting away from the African plate, it passed over the reunion hotspot, and the ensuing volcanism lasted 600–800,000 years.

The volatile emissions led to acid rain and ozone depletion. A proposed global cooling led to the formation of ice sheets and a drop in sea level. A sea level drop of 100 m would lead to a total loss of intertidal zone, as the ocean floor falls dramatically beyond 100 m of the continental shelf. Thus, the marine life forms in the intertidal zone were the most affected during the K-T extinction while those in the deep zones were relatively unaffected, consistent with the fossil records. Finally, asteroid impact could have been the final nail in the proverbial Dinosaur coffin.

Were Dinosaurs affected by two tragedies, an asteroid impact and volcanic eruptions simultaneously? Most scientists agree that the two events occurred around the same time. It is not agreed whether the impact of the asteroid initiated Deccan volcanism or made it worse. Whatever the case, the mighty Dinosaurs had an equally mighty end and continue to be discussed and celebrated 66 million years after their extinction.

About the Author:

Ashish is an engineer turned ornithologist. He did his PhD on southern India endemic and globally threatened Yellow-throated Bulbul (*Pycnonotus xantholaemus*). Ashish is currently working as a Scientist-C at the Wildlife Institute of India. He is interested in avian conservation using a multi-pronged approach including genetics, long-term monitoring, field-based natural history studies, and community outreach.

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गंगा सभागार में राजभाषा कार्यशाला का आयोजन:
राजभाषा हिंदी में कार्य करने की अभिप्रेरणा

मोहित गुप्ता

10 दिसंबर 2024 को गंगा सभागार में **'राजभाषा हिंदी में कार्य करने की अभिप्रेरणा'** विषय पर एक विशेष कार्यशाला का आयोजन किया गया। इस कार्यक्रम का मुख्य उद्देश्य राजभाषा हिंदी के प्रति जागरूकता बढ़ाना और सरकारी कार्यों में हिंदी के उपयोग को बढ़ावा देना था। कार्यशाला में कुल **24 प्रतिभागियों** ने भाग लिया, जिनमें माननीय **डीन महोदया**, **कुलसचिव महोदय**, अधिकारीगण और कर्मचारी शामिल थे।

कार्यक्रम की शुरुआत स्वागत भाषण से हुई। डॉ. रूचि बडोला, डीन ने अपने संबोधन में हिंदी को सरकारी कार्यों में प्राथमिकता देने की आवश्यकता पर बल दिया। उन्होंने कहा कि हिंदी न केवल प्रशासनिक भाषा है, बल्कि यह देश के नागरिकों के साथ सीधा संवाद स्थापित करने का सबसे सरल माध्यम भी है।

इस अवसर पर **श्री महिमानंद भट्ट**, पूर्व निदेशक (राजभाषा), केंद्रीय भंडारण निगम, मुख्य वक्ता के रूप में उपस्थित थे। उन्होंने हिंदी को राजभाषा के रूप में प्रभावी ढंग से अपनाने के महत्व पर प्रकाश डाला और सरकारी कार्यों में हिंदी के उपयोग से संबंधित व्यावहारिक अनुभव साझा किए। उन्होंने बताया कि हिंदी केवल एक भाषा नहीं है, बल्कि यह हमारी संस्कृति और प्रशासनिक पहचान का प्रतीक है। श्री भट्ट ने हिंदी में कार्य करते समय आने वाली सामान्य बाधाओं और उनके समाधानों पर भी चर्चा की।

श्री महिमानंद भट्ट के व्याख्यान ने प्रतिभागियों को प्रेरित किया कि वे अपने कार्यस्थल पर हिंदी को अधिक सक्रियता से अपनाएं। उन्होंने उदाहरणों और व्यावहारिक सुझावों के माध्यम से प्रतिभागियों को प्रेरित किया कि कैसे वे अपने दैनिक कार्यों में हिंदी का सहज और प्रभावी उपयोग कर सकते हैं। कार्यशाला के दौरान प्रतिभागियों ने विभिन्न प्रश्न पूछे और हिंदी में कार्य करने से संबंधित अपनी समस्याएं साझा कीं। श्री भट्ट ने इन समस्याओं का समाधान देते हुए सरल और प्रभावी उपाय सुझाए।

कार्यशाला ने प्रतिभागियों को हिंदी में कार्य करने के प्रति नई ऊर्जा और दृष्टिकोण प्रदान किया। सभी प्रतिभागियों ने इसे उपयोगी और प्रेरक बताया। कार्यक्रम के समापन पर धन्यवाद ज्ञापन दिया गया, जिसमें सभी की सक्रिय भागीदारी और आयोजन को सफल बनाने के लिए योगदान की सराहना की गई।

लेखक के बारे में

मोहित गुप्ता भारतीय वन्यजीव संस्थान में सहायक निदेशक (राजभाषा) के पद पर सेवारत हैं। उन्होंने बनारस हिंदू विश्वविद्यालय और इलाहाबाद विश्वविद्यालय से शिक्षा ग्रहण की है। वे संस्थान में राजभाषा हिंदी से संबंधित नियमों के कार्यान्वयन में सहयोग कर प्रशासनिक उत्कृष्टता को प्रोत्साहित करते हैं।

Photo by Dipesh Kumar Jangir

BRIDGING MINDS AND RIVERS:
A JOURNEY OF CONSERVATION AT GIC NAGANI

Alankrita Sharma

A recent visit to GIC Nagani, a government school located near the serene Heval River in Tehri Garhwal, Uttarakhand took place from 8 to 11 December 2024. The school, surrounded by the beauty of nature, provided the perfect backdrop for our mission – 'National Mission for Clean Ganga' to raise awareness about river conservation and the biodiversity of the Ganga River. A bridge over the Heval River connects the school, and standing on that bridge, one cannot help but feel a sense of peace as the gentle flow of the river resonates all around. The sound of the river flowing below serves as a reminder of how vital these water bodies are to our existence. The students were first engaged in a session that highlighted the vital connections within the river ecosystem, where every species plays a role in maintaining the health of the river. Situated in the heart of nature, the school served as a perfect example of how interconnected we are with our environment.

Following the initial interaction with the students, a yoga session was held, offering the students a peaceful start and helping them connect with the natural world. This activity provided a chance to experience the balance and calm of nature. The day continued with interactive games designed by Ms Ashmika Aggarwal, including a butterfly identification activity which helped the students understand the importance of biodiversity and the delicate balance within ecosystems. The Ganga Aqua Life Knowledge Centre (Bal Ganga Prahari corner) was also inaugurated, offering a new resource to support further learning on aquatic ecosystems. Additionally, scholarships were provided to deserving students, encouraging their continued efforts in environmental conservation. This visit reaffirmed a key truth: *conservation is a shared responsibility that begins with awareness and grows through action.* At GIC Nagani, these values were planted, promising a cleaner, more sustainable future for all.

Yoga session with Students

Students involved in team building exercise

Students receiving Bal Ganga Prahari scholarship Award

Students receiving Bal Ganga Prahari scholarship Award

ODH RAJPUTS:
A TRIBE IN THE URBAN SANCTUARY OF DELHI

Rashi Nautiyal, Feba K.S., Shubham Kumar Maletha,
Mukesh Chand and Dr B.S.Adhikari

I. Who Are the Odh Rajputs?

The Odh Rajputs (also known as Oad or Ods Rajputs) are a nomadic tribe of labourers historically found in Sindh, Gujarat, Kathiawar, and parts of Rajasthan. Known for thriving in arid, rain-scarce regions, the term 'Odh' historically refers to skilled artisans specializing in constructing ponds, canals, embankments, and mud houses. Over centuries the OdhRajputs evolved into adept carpenters, masons, and stoneworkers, engaged in trading grains, spices, perfumes, and cloth. While the term 'Odh' originally denoted a profession or skill in earth masonry, it has since come to represent communities associated with such expertise.

II. Why Did the Odh Rajputs Migrate?

The migration story of the Odh Rajputs is a powerful narrative of resilience, adaptation, and survival. Their journey, spanning decades and driven by political upheaval, environmental challenges, and economic shifts, offers a window into the broader dynamics of migration in South Asia.

Partition of India (1947), a historic turning point: The partition of India in 1947 was a cataclysmic event that reshaped lives across the subcontinent. For the Odh Rajputs, the division of the nation marked the beginning of an arduous journey. Forced to abandon their ancestral homes in Sindh and West Punjab, they migrated to now divided India amidst waves of violence, political chaos, and the loss of livelihood. This search for safety and opportunity uprooted countless families, leaving an indelible mark on their community.

Resettlement in Delhi, building a new life:

In the wake of partition, many Odh Rajputs found a new home in Bhatti Village, Delhi. Here, they became integral to the city's burgeoning construction industry. The Bhatti Mines, operational between 1965 and 1990, offered them employment, with red sand and stone fueling Delhi's rapid urbanisation. Renowned for their masonry and stonework skills, the OdhRajputs contributed to iconic construction projects, turning adversity into an opportunity for economic integration and community rebuilding.

Economic and environmental push factors:

Long before the partition, migration was part of the Odh Rajput heritage. Originating in arid and semi-arid regions where water scarcity was a constant challenge, they honed expertise in water management and construction. Over time, these skills became a passport to opportunities in areas where infrastructure development demanded their expertise.

However, as environmental conditions worsened and traditional livelihoods declined, migration became a necessity rather than a choice. The loss of fertile land, coupled with economic hardships, pushed the OdhRajputs to explore new horizons, ensuring their survival and relevance in a rapidly changing world.

III. The Bhatti Mines Tragedy

In 1976, around 20,000 refugees, including the Odh Rajputs, settled in Bhatti Village, drawn by employment opportunities in the booming red sand and stone quarrying industry. For 14 years this community supported Delhi's construction needs. However, the tragic collapse of a mining pit on May 31, 1990, claimed seven lives, spotlighting grave safety violations. Consequently, Bhatti Mines were closed in 1991, leaving over 4,000 miners unemployed and without support.

The Struggle for Survival and Recognition

The closure of Bhatti Mines marked the beginning of decades-long struggles for the Odh Rajputs and other residents of Bhatti Village. Initially, the government granted ration cards and land titles to settlers. However, in 1984, the area was reclassified as a J.J. slum, and subsequent policies further marginalized the community. By 2001, ration cards were revoked due to fears of slum relocation, worsening their vulnerability. In 2006, demolitions by the Municipal Corporation of Delhi displaced 1,500 families.

Many residents received no compensation or alternative housing, compounding their plight. Despite these challenges, the community has actively fought for their rights through protests and awareness campaigns.

Socio-Economic Profile of Bhatti Village

The Socio-Economic Profile of Bhatti Village: 18,403 bighas and 3 biswas, with 5,022 bighas and 10 biswas currently being used for cultivation. In 1996, 11,101 bighas and 19 biswas of Gram Sabha land were notified as part of the Ridge in the Delhi Gazette, transferring a significant portion to the Forest Department

Challenges Faced by Bhatti Village Residents

1. Dependence on the Sanctuary for Basic Needs: Many villagers rely on the Asola Bhatti Wildlife Sanctuary for resources like timber and toilets.

2. Lack of Access to Gas and Clean Drinking Water: A significant portion of the population does not have access to cooking gas, forcing them to depend on timber for fuel. Additionally, clean drinking water is not readily available, exacerbating health and sanitation issues.

A group of women collecting firewood from the sanctuary.

3. Poverty and Lack of Government Support: The villagers live in poverty and lack access to government welfare schemes and basic amenities, leaving them marginalized and unsupported.

4. Inadequate Drainage System: The absence of a proper drainage system leads to untreated wastewater contaminating the abandoned mines, a crucial groundwater recharge zone for Delhi.

5. Poor Solid Waste Management: MCD vehicles service only the main roads, neglecting inner areas and leaving waste uncollected.

6. Educational Challenges: While the village has schools and anganwadis (childcare centers), schools are not entirely safe or well-equipped for students. Many girls stop attending school after the 8th grade due to safety concerns and inadequate infrastructure. Some students are forced to travel outside the village to pursue further education.

7. Macaque: Conflict with monkeys is a serious issue, with injuries and property damage affecting every household.

Untreated drainage water flowing into the sanctuary, a pressing environmental concern

Government School in Bhatti village

Government School in Bhatti village

8. Healthcare Deficiencies: The village lacks adequate healthcare facilities and infrastructure, further exacerbating hardships, particularly from monkey-related injuries.

Anganwadi in Bhatti village

About the Authors:

Rashi Nautiyal, Feba K.S, Shubham Kumar Maletha, and **Mukesh Chand** are researchers at the Wildlife Institute of India and work as Project Associates in the project "Developing an Integrated Management Plan for Asola-Bhatti Wildlife Sanctuary, New Delhi".
Dr B. S. Adhikari, Scientist G, WII is the PI of the above-mentioned project.

NEVER SMILE AT A MUGGER CROC:
GAPING BEHAVIOUR OF MUGGERS *(CROCODYLUS PALUSTRIS)* IN THE CHAMBAL RIVER BASIN

A regularly observed behaviour exhibited by muggers and other member species of Crocodylia is when they keep their mouths wide open for prolonged periods while basking during the day. This behaviour is called “gaping”. It is primarily associated with thermoregulation as crocodiles sweat through their mouths and this behaviour is considered as a basic way to cool down. They also have a symbiotic relationship with birds. When their mouth is left open, some species of birds feed on the debris between their teeth, cleaning and removing parasites from the muggers’ mouths. We were fortunate to witness this behaviour firsthand during our orientation tour in Chambal.

A closer look at the gaping behaviour of Muggers

The photographs were shot on a SONY RX10 camera on 26th Nov, 2024.
Aperture: 151.11mm f/4, Shutter speed - 1/640 sec, ISO -100, Exposure-0

Place: Upstream Chambal River stretch, Rajasthan.

About the Author:

Priyanjali Singh is currently a student of the first batch of the M.Sc. Freshwater Ecology and Conservation course at the Wildlife Institute of India. Her interest lies in understanding river systems and how their ecology and health are affected by the Inter-Water Basin Transfer between two rivers.

DETAILS OF PROGRAMME CONDUCTED BY EIACP CENTRE RESOURCE PARTNER "WILDLIFE AND PROTECTED AREAS MANAGEMENT"

XVIII WII-FODS Wildlife and Environment Quiz, 01 October 2024

The 70th National Wildlife Week 2024 was celebrated with the XVIII WII-FODS "Wildlife and Environment Quiz" on October 1, organized by the Wildlife Institute of India (WII), the Environmental Information, Awareness, Capacity Building, and Livelihood Programme (EIACP) Centre, and The Friends of the Doon Society (FODS). Nine schools from Dehradun and Mussoorie participated, with each sending three students for the preliminary round. The top five schools advanced to the finals, where The Oberoi School of Integrated Studies emerged as the champion, winning the WII-FODS Sameer Ghosh Trophy and the WII-EIACP Rolling Trophy. Wynberg Allen School and St. Joseph's Academy secured second and third prizes, respectively. The quiz not only fostered competition but also promoted awareness about wildlife and environmental conservation among the youth.

Infographic Competition, 01 October 2024

To celebrate National Wildlife Week, the EIACP Centre at the Wildlife Institute of India organized an infographic competition centred around the theme *"Wildlife Conservation Through Coexistence."*

The theme highlights the importance of living in harmony with the natural world, emphasizing that both wildlife and human communities can thrive together.

The competition encouraged participants to creatively explore and illustrate strategies that promote coexistence between humans and wildlife. By raising awareness of the challenges and solutions in wildlife conservation, the aim was to inspire a deeper understanding of our interconnectedness with nature.

Webinar: From Pixels to Conservation: Integrating UAVs, Computer Vision and Artificial Intelligence in Dugong Research

Sagar Rajpurkar, Principal Project Associate, Dugong-WII presentation, *titled "From Pixels to Conservation: Integrating Unmanned Aerial Vehicles (UAVs), Computer Vision, and Artificial Intelligence in Dugong Research,"* provided an engaging look at how cutting-edge technologies are being utilized to support the study and conservation of dugongs, a vulnerable marine species.

UAVs equipped with high-resolution cameras capture aerial footage, while computer vision techniques analyze these images to identify and track dugongs in their natural habitats. AI algorithms process large datasets, enhancing the monitoring of dugong health and movement patterns.

By combining UAVs, computer vision, and AI, the research aims to collect more accurate data on dugong populations, behaviours, and habitats.

Release of Special Cover on 70th National Wildlife Week, 05th October 2024

To mark the occasion, WII, Dehradun, in collaboration with the EIACP Centre under the Ministry of Environment, Forest and Climate Change (MoEFCC), released a special cover. This cover showcases India's national symbols of biodiversity: the Banyan tree (national tree), Lotus (national flower), Indian Peafowl (national bird), and Bengal Tiger (national mammal), underscoring the country's dedication to wildlife conservation. Additionally, the special cover highlights the 7 themes of Mission LiFE, advancing the mission's awareness initiatives.
The special cover was officially released by the Director General of Forests, MoEFCC, in the presence of distinguished dignitaries from both Central and State governments.

Release of Corporate My stamp on 70th National Wildlife Week, 05 October 2024

As part of the continued celebration of the 70th National Wildlife Week, WII, Dehradun, in collaboration with the EIACP Centre under the MOEFCC, released a Corporate My Stamp (Rs 5/-). The stamp features India's national symbols of biodiversity. Released by the Director General of Forests, MoEFCC, and the Chief Postmaster General of Uttarakhand in the presence of various dignitaries from the Central and State governments, it underscores India's commitment to wildlife conservation. It also highlights the collaborative efforts of government bodies and institutions in promoting environmental awareness and supporting conservation initiatives throughout the country.

Release of WII-EIACP Publication - 'Atlas of Riverscape: Cauvery River Basin' at the 35th Annual Research Seminar (ARS) of the Wildlife Institute of India, 05 October 2024

The Atlas of Riverscape: Cauvery River Basin is a comprehensive publication from the EIACP Centre at WII offering an in-depth exploration of the Cauvery River through a multidimensional lens. It combines ecological, anthropological, and economic perspectives to portray the river not merely as a geographical feature, but as a dynamic force that has shaped and supported life for millennia. The publication delves into the river's vital role in sustaining ancient civilizations, illustrating how human innovation and nature have coexisted and thrived along its banks. ichly detailed maps, GIS analyses, and narrative storytelling highlight the river's exceptional biodiversity and ecological significance.

This work is part of an envisioned series that will focus on other major river basins in India, providing a holistic view of these lifelines of the country. The Atlas was officially released during the 70th National Wildlife Week Celebrations at the Wildlife Institute of India, with the Director General of Forests and Special Secretary of the MoEFCC, gracing the occasion.

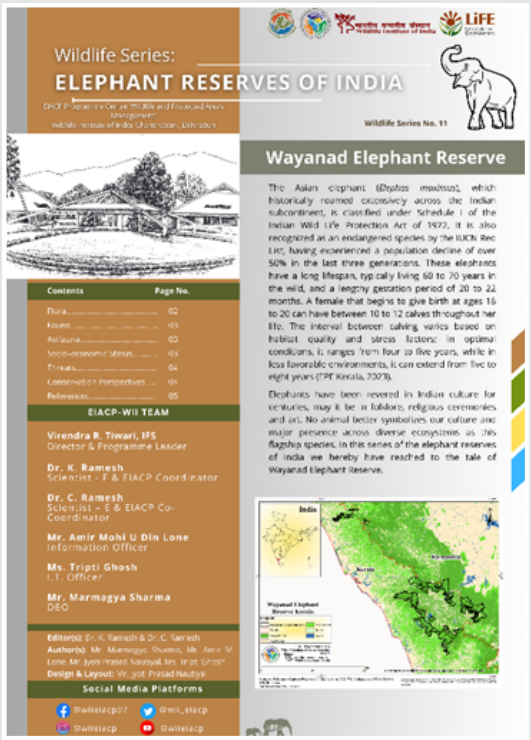
Webinar: Digital Innovation in Wildlife and a Bird's Eye View to Integrated Digital Platform for Wildlife Conflict Management, 08 October 2024

Yashas Shankar, Co-founder & Director of Keyfalcon Solutions Pvt. Ltd. shared his extensive experience in using technology for wildlife conflict management, offering valuable insights into innovative solutions that help bridge the gap between humans and wildlife. He discussed how digital tools, such as real-time monitoring systems, GPS tracking, and mobile apps, are being used to prevent and manage human-wildlife conflicts, ensuring the safety of both communities and animals. His presentation highlighted the challenges of integrating these technologies, including the need for accurate data, community engagement, and ensuring solutions are adaptable to various geographical and socio-economic contexts. His insights emphasized the crucial role of innovation in wildlife conservation and the importance of digital tools in creating sustainable solutions for human-wildlife coexistence.

Webinar: LiDAR for Wildlife Habitat Characterization, 08 October 2024

Akshay Pagude, PhD Scholar, FRI-DU, Dehradun in his presentation on "LiDAR for Wildlife Habitat Characterization," presented the application of Light Detection and Ranging (LiDAR) technology in mapping and analyzing wildlife habitats. LiDAR, a remote sensing tool that uses laser pulses to generate highly accurate, three-dimensional models of landscapes, allows for the precise mapping of forest structures, vegetation, and terrain. Akshay demonstrated how LiDAR can be instrumental in assessing habitat quality, pinpointing critical ecological features, and monitoring changes in vegetation that may affect wildlife populations. By offering detailed insights into habitat composition and structure, LiDAR enhances our understanding of ecosystem complexitie sand aids conservation efforts by identifying priority areas for wildlife protection. His presentation highlighted LiDAR's transformative potential in wildlife research, providing a more efficient and precise approach to habitat assessment than traditional methods.

Release of publication on Wildlife Series: Elephant Reserves of India: Wayanad Elephant Reserve Vol. 11, 09 October 2024



The Wildlife Series on Elephant Reserves of India, released by the EIACP at the Wildlife Institute of India (WII), highlights the importance of conserving elephant habitats across the nation. This series examines the ecological significance of these reserves, the challenges they face, and the strategies used for their protection. It explores the diverse flora, fauna, and avifauna, while also addressing the socio-economic conditions of local communities. Focusing on the Wayanad Elephant Landscape, the series emphasizes the threats of habitat loss and fragmentation due to human encroachment. Conservation efforts in the region focus on habitat protection and the creation of wildlife corridors to support sustainable elephant populations. The Wayanad Elephant Landscape boasts a remarkable diversity of fauna, serving as a vital sanctuary for nearly all the large mammals native to peninsular India. Among these, the elephant population stands out, with significant numbers roaming the reserve. However, these majestic creatures face serious challenges, primarily due to habitat fragmentation and human encroachment. As human populations expand and land use practices evolve—such as agriculture, urban development, and infrastructure projects—elephants are becoming increasingly isolated within small, fragmented patches of their natural habitat. Conservation efforts in the Wayanad Elephant Reserve aim to secure the survival of sustainable wild elephant populations by prioritizing habitat protection and the establishment of wildlife corridors.

Photo by Anurag Nashirabadkar

SPECIMENS KNOWN AND UNKNOWN:
INSIGHTS FROM A DAY AT FRI

Shreyas Prashant

On Friday, October 18th 2024, we made our way to the Forest Research Institute located in Dehradun. Upon our arrival, we were guided to the Forest Entomology Division. Little did I know that we were about to meet Dr Arun Pratap Singh, the author of "Butterflies of India" field guide, which I have relied on numerous times over the years. Meeting him in his office was a wonderful experience. He shared insights about this division, which once had over 140 scientists but has now shrunk to just 12. It was eye-opening to imagine an entomology department with so many scientists, especially given the current state of entomological research in the country, where only a few scientists are working on this incredibly biodiverse group of animals. Among those focusing on invertebrates, much of the research is limited to taxonomy rather than exploring the fascinating questions of adaptations, biogeography, and evolution.

Prior to our visit to FRI, I observed two very similar beetles that had comparable morphological characteristics. However, their limb endings and antennae were entirely different, which made me wonder: what drives the selection of such diverse traits? Another striking example arose during this visit with Dr. Singh. He showed us two peacock pansies (*Junonia almana*) in his collection. At a glance, they looked similar, as the upper side is typically visible when pinned. However, on closer examination, I noticed that one had a significantly different wing shape from the other. When I asked about this, Dr. Singh explained that one is the wet season form, while the other is the dry season form. Although I was aware of such forms, I hadn't realized that they existed in peacock pansies.

Later that day, I read a paper on the reasons behind these differences and how seasonal polyphenisms are selected. The paper discussed the factors influencing seasonal polyphenism in tropical butterflies. One intriguing detail I hadn't known before was that many butterflies use cues such as photoperiod, humidity, and temperature during the larval stage to determine which morph the larva will metamorphose into. Key differences between the wet season form (WSF) and the dry season form (DSF) of a particular butterfly species include eye spots, cryptic colouration on the underside, and wing shape. In the wet season form, spots are conspicuous and the colours and patterns are not particularly cryptic. In fact they can even appear aposematic in some instances. Conversely, the dry season form displays reduced or absent spots, more cryptic patterns on the underside and wing shapes that often mimic leaves to maximize camouflage.

Ypthima huebneri, the Common Four Ring, has small eye spots on the fringes of its wings.

Peacock Pansy, Wet Season Form.
The dry season form has no spots on the underside but features a line running through the centre and pointed wings to mimic a leaf.

When it comes to eye spots, it's interesting to note that the smaller spots along the edges of the underside can cause a predator to bite away from the vulnerable body region, while the large eye spots on the upper side (usually hidden at rest) can startle a predator, provoking a withdrawal response. There is also a balance between eye spots and crypsis; the spots shouldn't be too conspicuous but should still effectively deter predators.

Diving into the reasons for these seasonal adaptations: during the dry season, butterflies are generally less active, often entering periods of aestivation or semi-quiescence, making it advantageous to maximize crypsis.

Large eye spots on the upper side, which remain hidden unless needed, can help startle predators during an attack. In contrast, during the wet season, with abundant food and active mating, butterflies are more active. Complete crypsis may not be as effective in this scenario, so aposematism and eye-like spots on the underside serve to deter predators. In the case of the peacock pansy, the dry season form develops a leaf-like wing shape, and the underside loses its spots.

ater, Dr Singh showed us his books on the unique roles of each butterfly species in Uttarakhand, which were both inspiring and filled with novel research.

Erebus ephesperis has large eye spots to deter predators

LWe also viewed their butterfly collection which was stunning—brimming with lifers and fascinating stories. Additionally, there was a relatively new moth collection which was assembled through recent projects that estimated the distribution of moths in the Shivaliks. Following this, we were briefed on their research regarding sal borers (*Hoplocerambyx sp.*).

We were then led to the museum, where we saw numerous British-era collections and skeletons from a wide variety of mammals. Unfortunately, we couldn't view the institute's larger collection due to ongoing renovations

We then visited the museum's ground floor, crossing a courtyard filled with hundreds of swifts, and entered a beautiful gallery showcasing entomological specimens and historically significant equipment. A special moment for me was seeing the Kaiser-i-Hind butterfly (*Teinopalpus imperialis*)—a remarkably rare species. Although it was an old specimen that no longer displayed its true colours, I've heard stories of people mistaking it for a green plastic wrapper until it took flight, revealing its iridescent green hue.

The Common Banded Peacock *(Papilio crino)* belongs to the same family as the Kaiser-i-Hind *(Teinopalpus imperialis)* and displays a similarly iridescent green wing coloration

We also saw a few moths, including one particularly interesting specimen with ocelli-like markings on its wings. These markings were transparent and lacked scales which was unusual. Reflecting on how and why this might have evolved, it seems that transparency could reduce the cost of wing pattern production while also aiding in predator deterrence. The transparency might create an illusion of movement in the ocelli, mimicking real eyes. Afterwards, we returned to the bus and made our way back to WII.

About the Author:
Shreyas Prashant is an M.Sc. Wildlife Science student at WII. He is interested in fundamental ecological and evolutionary questions. His writings are inspired by the various field experiences - in the intertidal zones of Mumbai, studying butterflies in Arunachal Pradesh and Brahminy Kites in Karnataka, and field excursions in Uttarakhand.
Photo Credits: Shreyas Prashant

ROARING TAILS:
LION OF GIR AT THE INTERNATIONAL BOOK FESTIVAL, AHMEDABAD

Simran Aggarwal

On 6th December 2024, WII-NMCG brought the magic of conservation to the Ahmedabad International Book Festival, held at the Sabarmati Riverfront in Gujarat. The event was organized by the National Book Trust where the session on 'Lion of the Gir' was a vibrant mix of education and engagement through a game-based learning method designed to inspire young minds.

The session began with a riveting lecture by Dr Sangeeta Angom, who introduced the audience to the majestic Asiatic Lions of the Gir Forest in Gujarat. During the talk she shed light on these apex predators' critical role in the ecosystem, the threats they face, and ongoing conservation efforts. The young audience listened intently, gaining a deeper appreciation for these iconic creatures and their significance in maintaining ecological balance.

Simran Aggarwal facilitated an engaging newspaper-based game centred on the sympatric species of lions and tigers, emphasizing their coexistence and unique contributions to biodiversity. The activity encouraged critical thinking about conservation and sparked lively discussions among the participants.

The event culminated in an exciting finale with the activity 'Big Cats Knock Clock'. Participants collaborated to identify and answer questions about the six big cat species, exploring their physical traits, habitats, and distribution. The children's enthusiasm and teamwork were truly remarkable as they showcased their knowledge and competitive spirit with great energy.

Children engaged in collaborative team-building exercise

Children engaging in Big Cats Knock-Clock activity

Lecture by Dr. Sangeeta Angom on 'Lions of the Gir'

YOUTH FOR SAVING GANGA RIVER:
'RASHTRIYA EKIKARAN SHIVIR'

Mohd Danish Kaleem

The WII-NMCG team conducted a sensitization workshop for NSS volunteers at the 'Rashtriya Ekikaran Shivir' in Rohilkhand University, Bareilly. The workshop witnessed enthusiastic participation from 206 NSS volunteers and 20 Programme Officers representing 12 states across India.

The primary focus of the workshop was to educate participants about the rich biodiversity of the Ganga River and its tributaries. Experts from WII highlighted the ecological importance of these riverine ecosystems and the urgent need for their conservation. The session emphasized the critical role that youth can play in preserving and restoring aquatic habitats and their biodiversity.

Interactive activities such as hands-on sessions, group exercises, and outdoor games were organized to engage participants and deepen their understanding of biodiversity conservation.

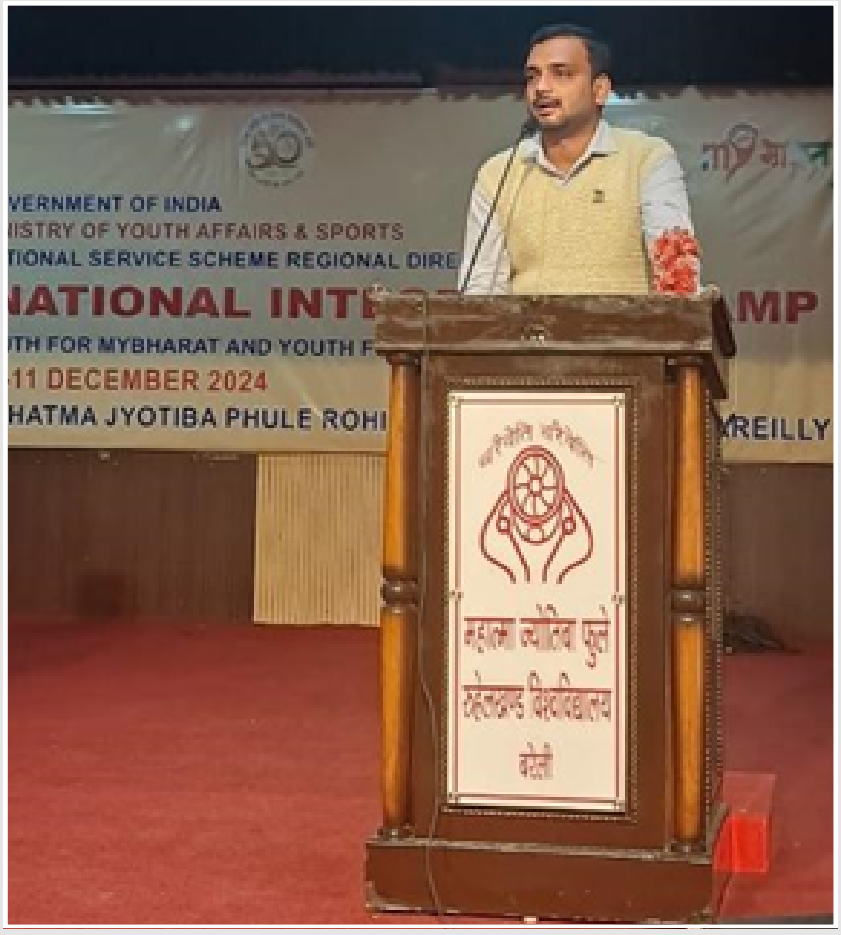
The activities encouraged teamwork and problem-solving skills, reinforcing the importance of collaboration in addressing environmental challenges. The workshop concluded with a quiz that tested the knowledge gained by participants and reinforced key learnings.

Speaking at the event, the WII-NMCG team stressed the need to integrate biodiversity conservation into daily practices and called upon the youth to act as ambassadors of change. The workshop successfully instilled a sense of responsibility among NSS volunteers to safeguard rivers, ensuring the long-term health of India's aquatic ecosystems. It demonstrated the power of collective action and highlighted the indispensable role of youths in shaping a sustainable future for freshwater river conservation.

Group picture of WII-NMCG team with NSS Programme Officers

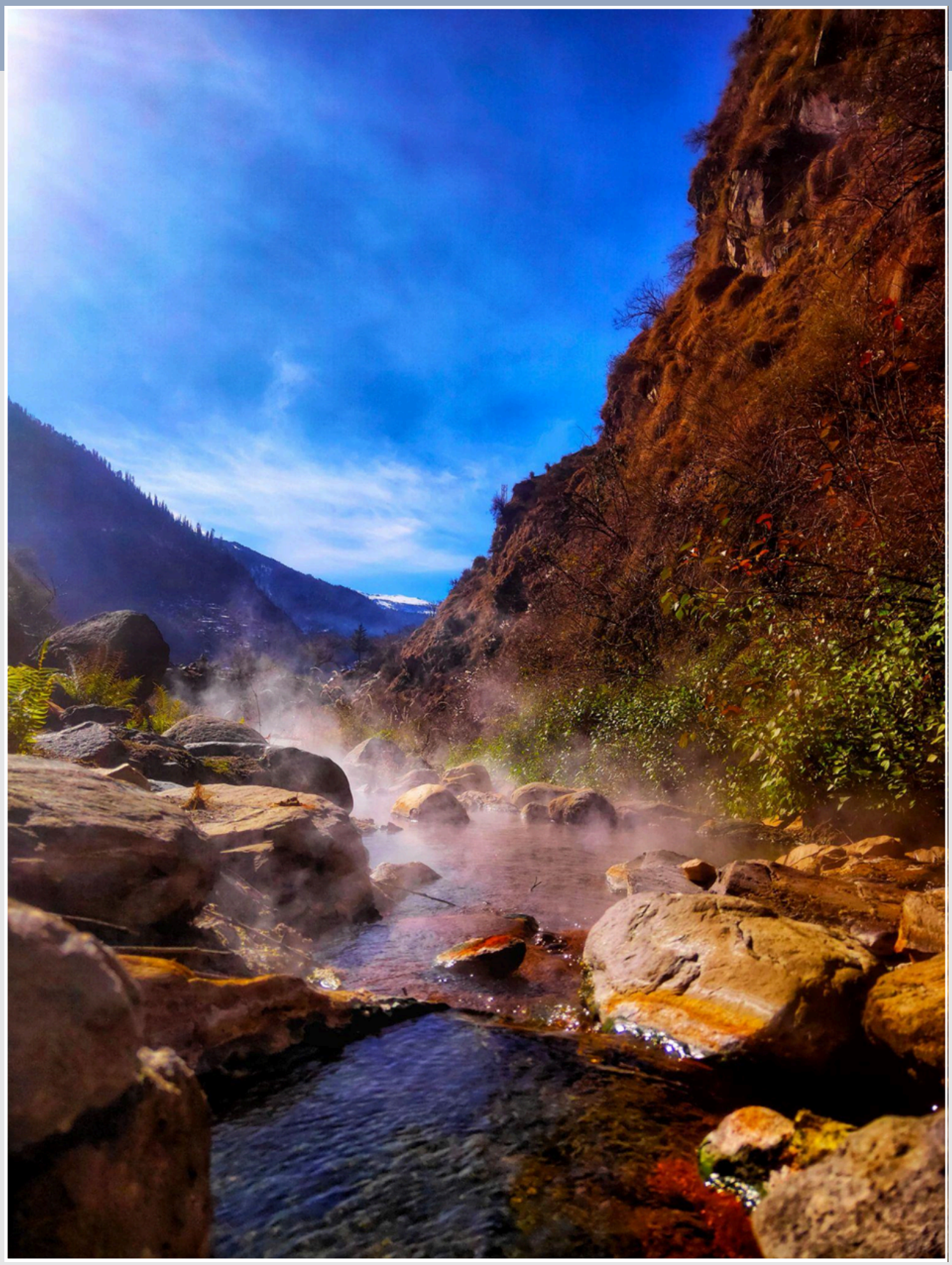
Dr. Soufil Malek interacting with NSS Volunteers

NSS Volunteers playing Wildlife Knock-Clock



WII-NMCG team member interacting with the participants

THE CALMING HEAT OF BANAS SPRINGS



Banas Village, located in Uttarkashi, Uttarakhand is cradled by the embrace of nature and is blessed with a remarkable gift—its steaming hot spring waters. Rising from the Earth's core, these springs flow like liquid warmth in Yamunotri. These geothermal springs, rich in minerals, emerge from the depths of the Earth, offering a unique blend of warmth and therapeutic properties. The steam rising gently into the air and the mineral-rich patterns etched onto the surrounding rocks create a captivating visual and sensory experience.

Through this photograph, I aim to showcase the tranquil beauty and geological significance of these hot springs, inviting viewers to explore the soothing retreat that Banas Village provides.

The photograph was captured using a Realme 3 Pro phone camera on Jan 1st, 2025.
ISO-160, Exposure Time- 1/2749s, Aperture- F1.7

Place - Banas Village, Yamunotri
District - Uttarkashi, Uttarakhand

About the Author:

Ashmika Aggarwal is a Project Associate-I at the Wildlife Institute of India, currently contributing to the NMCG Capacity Building Project from 2022. Her role involves designing educational games focused on conservation for school students. Ashmika is passionate about creative pursuits, including painting, wildlife photography, and design.

CELEBRATION OF THE GIS DAY
21ST AND 22ND NOVEMBER 2024

On the occasion of GIS Awareness Week 2024, the Wildlife Institute of India celebrated GIS day on 21st and 22nd November 2024 for the fifth consecutive year. As a part of the event, WII organized a two-day workshop focused on the applications of Remote Sensing and GIS.

Over 70 researchers took part in a workshop that spanned two days, combining both theoretical and practical sessions. The workshop program featured a total of five sessions. Day 1 included the following sessions: Data Availability for RS and GIS (Theory) and hands-on sessions on ArcGIS Pro, Google Earth Pro, and MStripes. On Day 2, a hands-on session on Google Earth Engine was conducted. The workshop also included two quiz competitions and a map-making competition.

Inauguration of the GIS Day event by Sh. Virendra R Tiwari, Director WII and Dr. Gautam Talukdar

Five different hands-on sessions were conducted during the GIS Day Workshop

As part of the celebrations, an engaging Quiz and Map Making competition was organized, adding an exciting and interactive element to the proceedings. Participants demonstrated their skills and creativity, and the winners were duly recognized and awarded. The success of this year's event and positive feedback from participants has provided valuable encouragement, inspiring the team to organize an even more successful event next year.

The valedictory was attended by Dr. S. Sathyakumar, Registrar, WII and Dr. Gautam Talukdar

PLASTIC TO PURPOSE:
INSPIRING YOUNG MINDS FOR RIVER CONSERVATION

Nidhi Singh

In a recent collaboration with the Women Empowerment Welfare Society, Kanpur and WII-NMCG project, a sensitization programme was conducted at Royal Dream World School, Kanpur, focusing on the critical issues of Ganga biodiversity and plastic pollution. This initiative aimed to raise awareness among students about the significance of preserving the rich biodiversity of the Ganga River and the environmental hazards caused by plastic waste.

The event was organized with the active participation of both the school's staff and students. A key highlight of the program was the drawing and painting competition, where students showcased their creativity while illustrating the themes of river conservation, biodiversity, and the adverse effects of plastic pollution. The artwork reflected the students' understanding of the Ganga River's importance and their concern for the environment, highlighting the urgent need for conservation efforts.

Additionally, the students participated in a 'Best out of Plastic Waste' contest, which encouraged them to use discarded plastic items to create innovative and artistic models. The contest provided hands-on experience in repurposing waste material into something useful and creative, reinforcing the idea of recycling and upcycling as essential practices in waste management. The students made a zoo including miniature animals entirely of plastic material, demonstrating their ingenuity and environmental awareness. Throughout the day, the students were engaged in interactive activities such as riddles and scrabble games, designed to enhance their learning in a fun and exciting manner.

The students who demonstrated exceptional creativity and innovation were recognized and awarded prizes for their efforts. This sensitization program was a valuable initiative, highlighting the power of education and engagement in tackling environmental challenges, and reinforcing the need for collective action to protect our natural heritage.

Interactive sessions on Life in Ganga

Biodiversity Park made by Recycled Plastics

Photo by Shashank Nagarale

SAFEGUARDING OUR NATURAL LEGACY:
CAPACITY BUILDING FOR DECLARATION OF UNESCO WORLD HERITAGE SITE FOR INDIAN FOREST SERVICE (IFS) OFFICERS

Jonathan Edward De Rozario

The 1972 UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage, commonly known as the World Heritage Convention, aims to safeguard natural and cultural legacies of global importance. However, heritage aspects are often overlooked in protected area management plans. To address this, the WII-C2C organized a capacity-building workshop for the Declaration of UNESCO World Heritage Sites for Indian Forest Service (IFS) officers from November 25-29, 2024, at the centre. Sponsored by the Research and Training (RT) Division of the Ministry of Environment, Forest and Climate Change of India (MoEFCC), the workshop aimed to equip participants with the skills to incorporate heritage concepts into management practices and introduce them to the process of inscribing World Heritage sites

The cohort consisted of 12 IFS officers from six states—Maharashtra, Madhya Pradesh, Karnataka, Chhattisgarh, Himachal Pradesh, and Tamil Nadu. Some officers had prior experience managing World Heritage Sites such as the Bhimbetka Caves and Kaas Plateau, while others were stationed in heritage-rich landscapes like the Spiti Valley. The workshop covered topics including the application of heritage in management, the impacts of the World Heritage Convention, understanding the Nomination Dossier format and documentation, as well as case studies and best practices in World Heritage Site management. The course featured 14 sessions conducted by five resource persons from WII and WII-C2C, as well as four external domain experts, including former IFS officers.

Following the classroom sessions, participants visited Keoladeo National Park (KNP), a Natural UNESCO World Heritage Site. The Wildlife Warden of KNP demonstrated the management of the site and its heritage values. Participants learned about introduced species such as the Indian rock python and the eradication processes for invasive species like Prosopis juliflora and the African catfish Clarias gariepinus. The field visit continued to Fatehpur Sikri, one of India's Cultural World Heritage Sites, where the concepts of nature-culture linkages in heritage were elaborated. Even for sites not designated as World Heritage Sites, the workshop highlighted aspects of local, regional, and national heritage that can enhance conservation efforts if properly utilized.

In the feedback received from the trainees, they appreciated that the course helped them perceive heritage in a more holistic manner and add value to their management strategies. The course also aided them in understanding the potential of the World Heritage Convention in wildlife conservation and community engagement.

About the Author:
Mr. Jonathan Edward De Rozario works as a Project Associate in WII- C2C (Category 2 Centre on World Natural Heritage Management and Training for Asia and the Pacific Region).

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Participants of the Capacity Building programme with WII Faculties and staff

Participants during a lecture session

Field session at Keoladeo National Park

FESTIVE CHEER WITH A CONSERVATION CAUSE:
STUDENTS OF THE LEARNING TREE SPECIAL SCHOOL

Aarti Chauhan

On December 20th, 2024, the Learning Tree Special School, Dharampur came alive with festive joy and environmental consciousness during a vibrant Christmas celebration. The celebration was organized by the WII-NMCG Team under the Bal Ganga Prahari Programme. This unique event focused on empowering students to express their creativity while connecting them to the vital cause of conserving the Ganga River's rich biodiversity.

At the heart of the event lay a creative card-making workshop where 50 enthusiastic students displayed their artistic perspectives and talents. Their handmade cards featured Christmas trees and other festive symbols, each infused with elements of nature and biodiversity. In addition to card-making, a butterfly identification game was conducted, providing the students with an interactive way to learn and identify various butterfly species found around us.

These artworks and engaging activities beautifully blended the holiday spirit with a message of environmental conservation.

This year's theme, "Celebrating Christmas with Conservation," brought a deeper purpose to the festive cheer. Through the workshop, students became young ambassadors for environmental sustainability, spreading awareness about the need to protect the fragile biodiversity of the Ganga River. The event also emphasized impactful ways to contribute to conservation and celebrate responsibly. The celebration was much more than an event—it was a beautiful fusion of festive joy, inclusivity, and environmental stewardship. These special students not only brightened the festive season but also illuminated the path toward a sustainable and harmonious future.

Let's celebrate their spirit and pledge to make every season a season of giving back to nature!

Students showcasing their creativity with Art and Craft of Christmas Tree

Students identifying butterflies

Group photograph with the special students

BREAKING BARRIERS FOR VISUALLY IMPAIRED STUDENTS:

INCLUSIVE CONSERVATION EFFORTS FOR THE GANGA RIVER

Anshul Bhawsar and Kumari Babli

'By joining hands, we can make a real and positive impact on our world'

In an effort to promote environmental inclusivity and awareness, the Wildlife Institute of India (WII), in collaboration with the National Institute for the Empowerment of Persons with Visual Disabilities (NIEPVD), organized a two-day workshop focused on the conservation of the Ganga River and its macro-aquatic species. The initiative aimed to create an accessible and immersive learning experience, empowering visually impaired students with knowledge and skills to contribute actively to environmental conservation. The workshop's oral presentations took the students on a vivid journey along the Ganga River. Through engaging storytelling, participants explored the river's ecological importance and the critical role its diverse species play in maintaining a balanced ecosystem. The session highlighted iconic aquatic species such as otters, gharials, turtles, crocodiles, and the endangered Gangetic dolphins.

Though eyes may not see, hearts can feel the Ganga's story, its truth, and its zeal. A special sensitization programme was organized to raise awareness about the Ganga River and its tributaries among visually impaired students of Model School, NIEPVD, Dehradun. A total of 75 students actively participated, shared their views, and gained valuable insights into the environmental importance of the Ganga River and its conservation.

The session included interactive lectures explaining the ecological significance and biodiversity of the river system.

The workshop also incorporated hands-on activities using 3D models of key species found in the Ganga River Basin. Students explored the physical characteristics of each animal through touch, enhancing their understanding of the unique features of these aquatic creatures. This sensory approach deepened their appreciation for aquatic biodiversity and helped in experiential learning. Interactive games and activities were integral to the workshop, designed to reinforce key environmental concepts engagingly and memorably, like the Sorting Game, which emphasized the importance of waste management and keeping the Ganga River clean and healthy. Another highlight was the Bird and Mammal Sound Recognition activity, where students showcased their impressive auditory skills by accurately identifying various sounds from nature. These activities encouraged active participation and fostered teamwork and environmental responsibility. The Web of Life Game further illustrated the intricate interdependence of species within the riverine ecosystem. Students learned how disruptions in one part of the food chain could trigger cascading effects throughout the ecosystem. The workshop concluded with a guided Nature Trail, offering students an opportunity to explore the environment through touch and sound.

This workshop successfully blended education, inclusivity, and environmental advocacy, proving that barriers can be overcome with innovative and empathetic approaches. By creating an accessible platform for environmental education, the Wildlife Institute of India and NIEPVD have not only empowered visually impaired students but also set a strong example of inclusive environmental stewardship.

Engaging lessons with 3D models, sound recordings, and interactive sessions for waste segregation

Group Photographs with Dr. Ruchi Badola, Dean, FWS and PI WII-NMCG Project and Resource persons

COLLARING AS A CONSERVATION TOOL:
AIDING ELEPHANT RECOVERY IN MADHYA PRADESH

Gorati Arun Kumar, Ritesh Vishwakarma, Bhaskar Bhandari, Nitin Gupta, Abhay Sanger, Suvankar Biswas, P. K. Verma and Anupam Sahay

Elephants, the largest terrestrial mammals and mega-herbivores, are significant for their size and for their indispensable ecological role in shaping forest ecosystems. These gentle giants contribute to seed dispersal, maintain ecological balance, and create habitats for other wildlife species. By trampling vegetation and uprooting trees, elephants help create clear ground that allows new plant growth, fostering biodiversity. Their ecological importance as iconic keystone species underscores the need for their protection and conservation.

The Historical Decline and Recent Revival in Madhya Pradesh

Historically, elephants were distributed in diverse landscapes across India, from dense forests to grasslands and river valleys, including the verdant forests of Madhya Pradesh. These landscapes not only provided shelter but also served as critical corridors for elephant movement. However, their range dramatically shrank with habitat loss, urbanisation, and extensive infrastructure development such as highways, railways, and dams. Human encroachment on forests and agricultural expansion further exacerbated the problem, leaving elephant populations fragmented and vulnerable. Madhya Pradesh, once a thriving habitat for elephants, witnessed their local extinction centuries ago due to excessive hunting and deforestation.

Yet, a remarkable phenomenon has surfaced in recent years: elephants have begun to migrate from neighbouring Chhattisgarh into Madhya Pradesh, rekindling the potential for their return to this central Indian state.

Since 2018, the Bandhavgarh Tiger Reserve (BTR) has documented increasing elephant movements, marking a significant ecological event. These migrations are believed to be driven by a combination of factors, including habitat degradation in their native ranges, competition for resources, and natural exploratory behaviour.

Addressing Human-Elephant Conflict

While the resurgence of elephants in Madhya Pradesh is ecologically significant, it has also led to complex challenges. Human-elephant conflict (HEC) has emerged as a pressing concern, primarily in areas where agricultural fields and human settlements border forested regions. Elephants, driven by their need for food and water, often venture into farms, causing significant crop damage and occasionally, human casualties. Such incidents escalate tensions between local communities and wildlife conservation efforts, necessitating immediate and innovative solutions.

In response to these challenges, the BTR team undertook a groundbreaking initiative: capturing and relocating a wild elephant to the Aaman-nala elephant camp on March 2, 2024. This elephant, which had repeatedly strayed into human settlements, was later equipped with a GPS/VHF collar on November 20, 2024. This marked the first-ever collaring of a wild elephant in Madhya Pradesh, setting a precedent for wildlife management in the region.

A second elephant, involved in similar conflict incidents, was captured on November 3, 2024, and similarly collared on December 9, 2024.

These operations were executed with technical support from the Wildlife Institute of India (WII), Wildlife Conservation Trust (WCT), and WWF, showcasing a collaborative approach to conservation. The collaring operations aimed to monitor the elephants' movements in real time, enabling forest officials to anticipate and mitigate potential conflicts. This real-time information is invaluable for understanding their habitat preferences, feeding behaviour, and movement patterns. It will also inform how elephants use forest corridors, their seasonal migration patterns, and their interactions with human-dominated landscapes; this information could form the basis for making conservation-oriented decisions. These insights gained from these monitoring efforts inform habitat management and conflict mitigation plans. Additionally, this data helps identify critical habitats and corridors that require protection or restoration, ensuring the long-term survival of elephants in Madhya Pradesh.

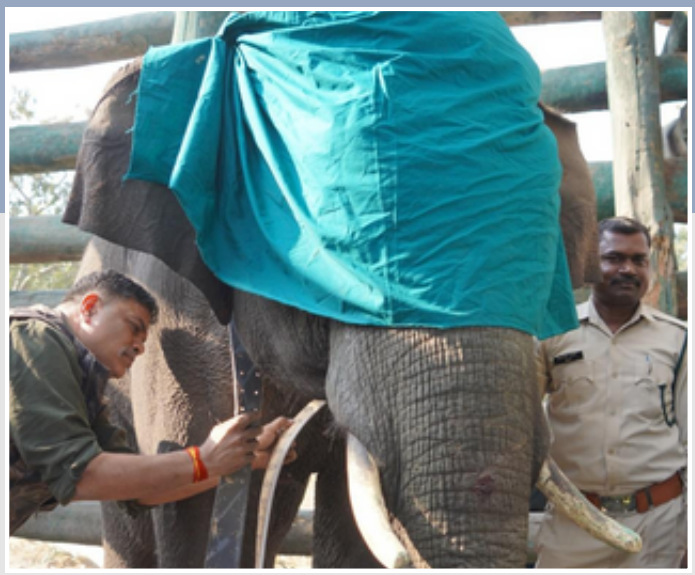
Beyond conflict mitigation, such monitoring also contributes to ecological research. By studying elephant behaviour and habitat use, researchers can better understand the ecological roles these animals play in Madhya Pradesh's landscapes. This knowledge is essential for formulating policies that balance conservation goals with human development needs.

A Vision for the Future

The resurgence of elephants in Madhya Pradesh is not merely an ecological event; it is a testament to the resilience of nature and the power of human ingenuity in wildlife conservation. As these megaherbivores are re-occupying their ancestral habitats, they symbolize conservation anticipation, balance, and the enduring bond between humans and elephants. By safeguarding elephants, we ensure the health of entire ecosystems, benefiting not only wildlife but also future generations of humans.

Drug preparation for immobilisation

Administering drugs to immobilise the elephant



Blind folding and collaring the elephant

Group photograph of the team

Elephant equipped with a GPS/VHF collar on 20th November 2024

Elephant equipped with a GPS/VHF collar on 9th December 2024

Checking the radio-collar frequency and its VHF range of collared elephant

About the Author:

Gorati Arun Kumar is a researcher at the Wildlife Institute of India and a Project Associate in the Gaur Supplementation Project in Bandhavgarh Tiger Reserve, Madhya Pradesh.
Photos: Gorati Arun Kumar.

INAUGURATION OF THE PASHMINA AND NEXT- GEN DNA SEQUENCING FACILITIES AT WII

Dehradun, 21 December 2024: Hon'ble Union Minister for Environment, Forest and Climate Change Shri Bhupender Yadav, inaugurated the Advanced Facility For Pashmina Certification, along with the Next Generation DNA Sequencing Facility at the Wildlife Institute of India (WII), Dehradun. The new facility builds on the foundation laid last year when the Hon'ble Minister inaugurated the Pashmina Certification Centre (PCC) and issued its first unique ID barcode and certificate.

In the year since its establishment, the PCC has certified over 15,000 shawls, ensuring their authenticity and enabling seamless trade of genuine Pashmina products in both national and international markets. The upgraded Advanced Facility For Pashmina Certification now includes a dedicated Scanning Electron Microscope (SEM) with Energy Dispersive Spectroscopy (EDS), which enhances the precision and reliability of wool testing and certification

A Milestone in Atma Nirbhar Bharat
The PCC, established under a Public-Private Partnership (PPP) model through a Memorandum of Understanding (MoU) between WII and the Export Promotion Council for Handicrafts (EPCH), exemplifies the government's commitment to supporting artisans, weavers, and traders while fostering self-reliance in traditional handicrafts.

The upgraded facility offers:

- Advanced Fiber Analysis: SEM-EDS technology to accurately identify and authenticate Pashmina fibres.
- Streamlined Certification: Unique ID tagging and e-certificates for traceability and quality assurance.
- Global Trade Facilitation: Hassle-free movement of certified products, eliminating delays and financial losses due to fibre scrutiny at exit points.

Supporting Artisans and Conservation Efforts
Pashmina is a cornerstone of livelihood for the artisan and weaver communities of Jammu & Kashmir. The PCC plays a vital role in promoting their industry by certifying genuine products, enhancing their credibility in global markets, and ensuring fair trade practices. Additionally, the facility discourages the use of prohibited fibres, indirectly contributing to the conservation of the Tibetan antelope (Chiru), whose habitat was previously threatened by the illegal trade in Shahtoosh wool.

A Self-Sustaining Model
The PCC represents a unique, self-sustaining initiative within a government organization, generating revenue while creating employment opportunities for budding professionals under the PPP model.

Shri Bhupender Yadav lauded the Wildlife Institute of India and the EPCH for their collaborative efforts in establishing this world-class facility. He reiterated the government's commitment to preserving India's rich cultural heritage while promoting sustainable development and biodiversity conservation.

Photo by Vikas Verma

WINTER HIGHLIGHTS

FELICITATION CEREMONY UNDER SWACHHATA PAKHWADA

A ceremony was held to acknowledge the efforts of Ganga Praharis and Bal Ganga Praharis Schools for their contributions towards an Aviral and Nirmal Ganga. The event, titled "The Ripple Effect: Celebrating the Swachhta Heroes," took place at the Wildlife Institute of India in recognition of Swachhta Pakhwada held from 17 September to 2 October 2024 .

FELICITATION OF PROF. QAMAR QURESHI

Professor Qamar Qureshi, Senior Professor and Scientist-G at the Wildlife Institute of India, is a distinguished authority in wildlife research, education, and conservation. With an M.Sc. and M.Phil. in Wildlife Science from Aligarh Muslim University and specialized training in GIS and Remote Sensing from Colorado State University, US, he has made significant contributions to landscape ecology, population dynamics, and species conservation, particularly of large carnivores and ungulates across South Asia. He has been the architect of the All India Tiger Monitoring Program, which is now globally lauded. A statistical guru, his work has been pivotal in the reintroduction of endangered species such as tigers, rhinos, gaurs, and cheetahs.

Professor Qureshi has authored over 175 research papers, supervised more than 30 Ph.D. candidates, and guided more than 100 master's dissertations, leaving a profound impact on wildlife education. He has been recognized with prestigious awards such as the Carl-Zeiss Award and the Earth Hero Award for his dedication to tiger conservation. As an advisor to national conservation bodies, his expertise continues to shape wildlife management and conservation strategies both nationally and internationally. MoEFCC honoured him for his dedication and lifetime service to wildlife conservation on the occasion of Wildlife Week.

CHIEF WILDLIFE WARDEN'S MEETING

Chief Wildlife Wardens, ADG(WL), and experts met on 4 October 2024 at the Wildlife Institute of India in Dehradun to discuss crucial wildlife management issues, including emerging challenges and invasive species. This meeting was crucial for India's conservation future.

COLLABORATION WITH INDIAN NAVY FOR NAVIKA SAGAR PARIKRAMA

The second edition of *Navika Sagar Parikrama* expedition, led by two women Navy officers, was flagged off on 2nd October 2024 and is planned to last for 240 days. WII researchers Dr. Swapnali Gole and Mr. Abhishek provided technical support for recording marine mammals and other megafauna during the voyage.

VISIT AND LECTURE BY RAPTOR EXPERTS

On 30 September 2024, WII welcomed two renowned raptor experts: Prof. William Bowerman, a Fulbright Senior Specialist expert on Sea Eagles & environmental pollutants, and Dr. Patrick Benson, distinguished for his research on Cape Vultures and raptor conservation. The visit included meetings with WII faculty for potential collaborations and tours of our labs (Forensics, Ecotoxicology, Pashmina Certification). Both gave insightful talks to M.Sc. students & researchers, sharing decades of research on raptors and conservation efforts.

35TH ANNUAL RESEARCH SEMINAR

The 35th Annual Research Seminar of the Wildlife Institute of India was held on 5th and 6th October 2024. The event was honoured by the presence of the Director General of Forests, MoEFCC. Dr. Ruchi Badola, Dean WII, emphasized the notable research accomplishments and innovations of Wildlife Institute of India. The program highlighted impactful conservation initiatives supporting India's wildlife and featured 32 oral presentations and 28 poster presentations across seven research themes.

EK PED MAA KE NAAM

"Ek Ped Maa Ke Naam", a national initiative launched by the Hon'ble Prime Minister, was celebrated at WII by the Director General of Forests and Special Secretary, MoEFCC, Govt. of India, Shri Jitender Kumar on 5th October 2024, to celebrate our bond with nature by encouraging tree planting and environmental stewardship. A step towards a greener, sustainable future.

PARTICIPATION IN THE 9TH WORLD CONFERENCE ON MOUNTAIN UNGULATES

The 9th World Conference on Mountain Ungulates themed “Transition to a new integrated and sustainable approach to species conservation” was held in Dushanbe, Tajikistan from 12th to 15th October 2024. Three faculty members and seven researchers from the Wildlife Institute of India attended the conference and showcased India's impactful work in wildlife conservation, including conservation strategies for snow leopards and other mountain ungulates, innovative research methodologies, and efforts in habitat restoration and wildlife management.

19TH M.SC. STUDENTS MARINE TOUR

The 19th M.Sc. Wildlife Students explored the depths of marine conservation during their Conservation Practice and Management Tour conducted between 14th October to 28th October 2024. The students gained valuable insights into marine habitat conservation issues and management.

SPORTS MEET

WII achieved significant success at the All India Forest Sports Meet in Raipur, Chhattisgarh, from 16th to 21th October, 2024. Ms. Urvashi, a Diploma Officer trainee, won gold in 50m breaststroke and silver in both 50m backstroke and 50m freestyle women's swimming events. Ms. Anubhuti Krishna, WII Researcher earned a bronze medal in women's open tennis category. WII office staff members Mr. Sanjay Bharti, and Mr. Gyanesh Chhibber secured a bronze medal in the veteran doubles table tennis category.

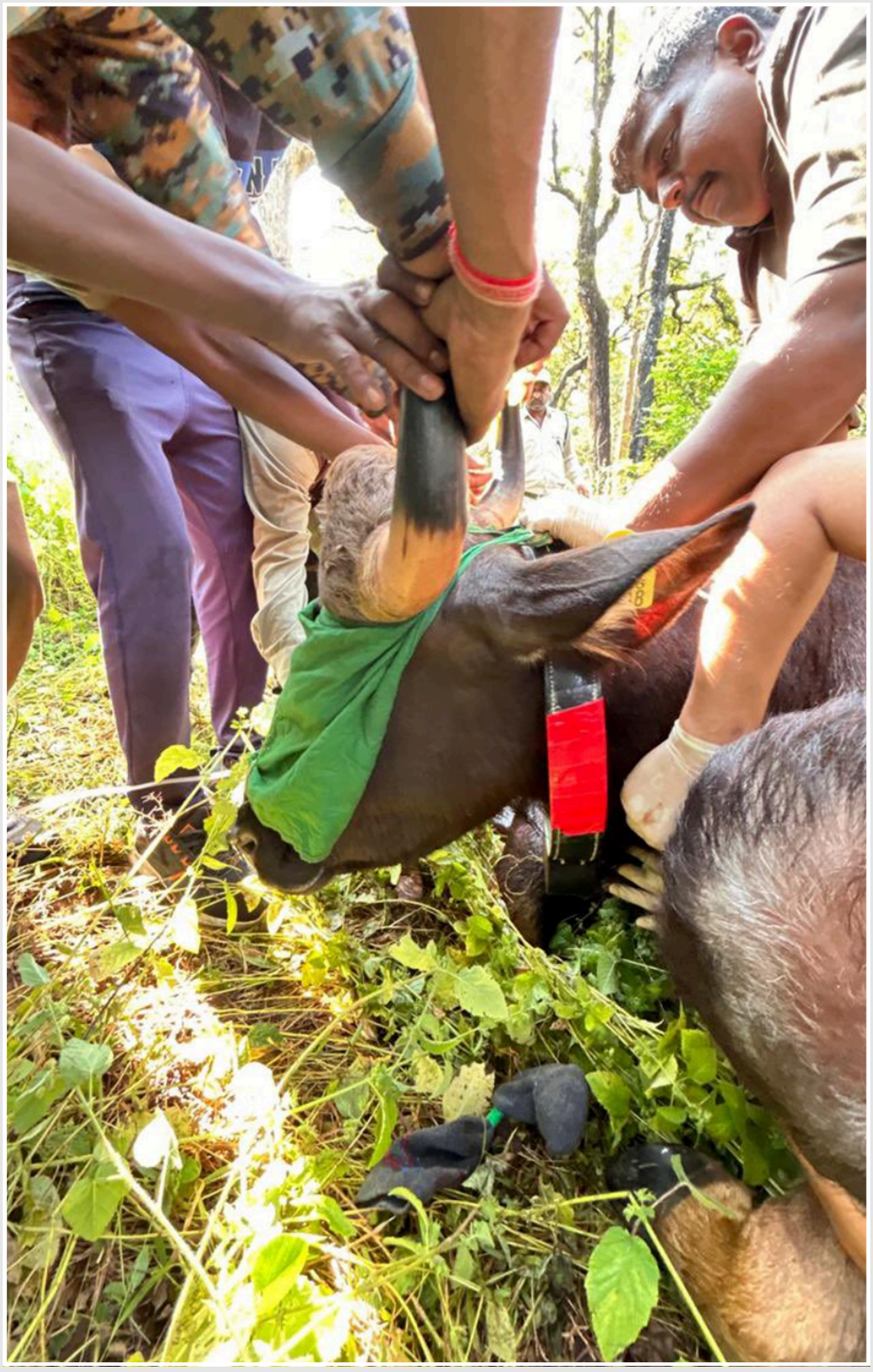
Photo by Mohib Uddin

A GLIMMER OF HOPE: ARTIFICIAL INSEMINATION IN GREAT INDIAN BUSTARD

The Bustard Recovery Program has achieved a historic milestone by producing the first Great Indian Bustard chick through artificial insemination in India at the National Conservation Breeding Centre, Jaisalmer. Scientists from the Wildlife Institute of India visited Abu Dhabi to learn this technique and applied similar procedure and experiment on the Great Indian Bustard. At the Ramdevra Breeding Centre, a male named Suda was trained for artificial mating and subsequently his sperm was collected, which was then used to inseminate a female named Tony on 20th September. This successful effort resulted in the birth of a chick on 16th October 2024.

COLLARING OF GAURS

WII team successfully collared five Gaur in Sanjay Tiger Reserve on 26th October 2024. This initiative would enable gathering of data on the movement patterns of gaurs and their behaviour, particularly in evaluating the success of the reintroduction efforts. This would also ensure monitoring the long-term survival of the species within the reserve.



STAKEHOLDER WORKSHOP ON SUSTAINABLE INFRASTRUCTURE DEVELOPMENTS IN THE TRANSBOUNDARY TERAI ARC LANDSCAPE

A three-day stakeholder workshop on mitigation planning for linear infrastructure developments in the transboundary Terai Arc Landscape took place in the Wildlife Institute of India, Dehradun from 23rd to 25th October 2024. Officials from India and Nepal participated to address key conservation challenges.

WII CRECHE: CARD MAKING WORKSHOP

On 31st October 2024, kids at WII Creche participated in a card-making workshop that sparked their imagination. WII's commitment to supporting working parents with reliable & nurturing childcare shines bright.

NEW SPECIES FOUND!!

1. A team of scientists from WII-SACON discovered a new bushfrog species from Meghalaya's Garo Hills. The species is named *Raorchestes asakgrensis* after the Eman Asakgre Community Reserve to honour the local people. This discovery, along with the rediscovery of *R. garo* and *R. kempiae* after a century, sheds light on the hidden amphibian diversity of this biodiversity hotspot.

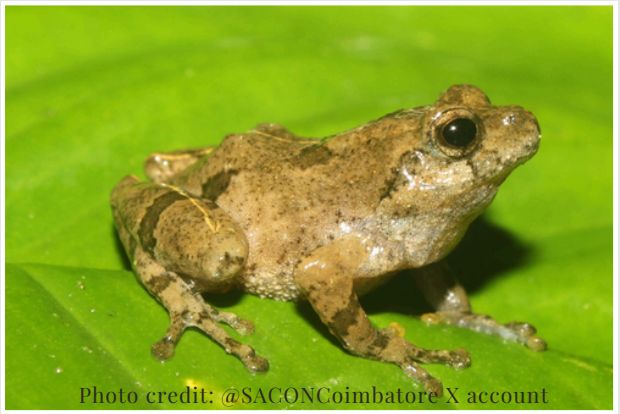


Photo credit: @SACONCoimbatore X account

2. A new distribution record of *Sorbus tianschanica* (Rosaceae) from a remote valley in the high-altitude cold desert of Ladakh by the WII team. The authors suggest further research work on species such as the *S. tianschanica* that are present at the margin of their distribution range or as relicts in small environmental pockets.

igure 2. Diagnostic features of *S. tianschanica*: A – Habit; B – Leaves; C&D – dorsal and ventral sides of eaves; E – Stem and bark; F – Flowers; G&H – fruits (Berries); I – Seeds.

TAGGING OF AMUR FALCON

The Manipur Forest Department with the support of the WII team, released two Amur Falcons on 8th November 2024 after tagging them with satellite transmitters to study their route and the influence of environmental patterns on their migration. The falcons were named “Chiuluan2” and “Guangram” after the names of the two villages (Chiuluan and Guangram) of Tamenglong district, Manipur.

“Chiuluan2” from the tagging site reached its first stopover site in Somalia flying non-stop over the Arabian Sea in five days and 17 hours and reached its non-breeding grounds in South Africa from Manipur in just two months.

3 DAY LONG ORIENTATION PROGRAMME

On 26th November 2024, the third Orientation Program under the NMCG-WII Jalaj Project was inaugurated by Shri Virendra R Tiwari, Director WII; Dr. Ruchi Badola, Dean FWS & Principal Investigator Jalaj project; and Dr. S.A. Hussain, Scientist G (Rtd.) and Project Manager. A total of 110 participants from seven Ganga River Basin States were trained during the three day programme in various dimensions pertaining to conservation-based livelihood initiative.

GANGES RIVER DOLPHIN AND FISHERIES SCHEME AWARENESS WORKSHOP

On 29th November 2024, CAMPA Dolphin team organized an awareness workshop on Ganges River Dolphin and fisheries scheme for local fishermen at Daspur, Paschim Medinipur District, West Bengal. Officers from the West Bengal Forest Department, and Sh. Virendra R Tiwari, Director WII; Dr. Vishnupriya Kolipakam, Scientist WII; and Shovana Ray, attended the workshop. WII team and Forest Department officials briefed fishermen on Dolphin conservation and sustainable fishing practices.

HANDS-ON TRAINING UNDER THE G2G MOU (BETWEEN INDIA AND CAMBODIA) NTCA AND WII

Under the India and Cambodia G2G MoU, the National Tiger Conservation Authority and Wildlife Institute of India, supported by the Ministry of External Affairs, conducted wildlife health, capture, and handling training for Cambodia's Ministry of Environment staff from 26th October to 3rd November 2024. Sessions in the Cardamom Rainforest and Phnom Tamao Zoo included chemical immobilization of Leopards and Tigers. These sessions prepared the team for their Tiger Recovery Programme in the Cardamom Rainforest Landscape.

M.SC. FRESHWATER ECOLOGY AND CONSERVATION ORIENTATION TOUR

The first batch of M.Sc. Freshwater Ecology and Conservation students went on a 14-day orientation tour from 15th to 27th November. The tour intended to explore various wetlands in different biogeographic zones. The tour was conducted in the Kollu river in the Lansdown division, Haiderpur wetland in Bijnor, Keoladeo National Park in Bharatpur, and the National Chambal Sanctuary in Morena. The students were oriented for different natural and manmade wetlands, their hydrology, sampling techniques for flora and fauna of wetlands and concerned management issues.

M.SC. WILDLIFE SCIENCES TECHNIQUES TOUR

M.Sc. Wildlife Sciences students attended a 9-day field course from 28th November to 10th December 2024. at Tadoba Andhari Tiger Reserve. They learned from WII faculty, researchers, field managers, and forest guards. As part of the tour, students conducted an occupancy analysis of 40 marked trees using colored pins as beetle presence proxies, collecting data on pin presence/absence, species identification, and tree girth measurements to study biodiversity dynamics and occupancy patterns.

REWILDING EGYPTIAN VULTURE IN CHHATTISGARH

In a first for Chhattisgarh and as part of a rewilding effort, a young Egyptian Vulture that was rescued a few months ago was geotagged and successfully released on 10th December 2024 at the Jungle Safari, Raipur with the technical support from the Wildlife Institute of India.

INTERNATIONAL MOUNTAIN DAY

To celebrate International Mountain Day on 11 December 2025, MoEFCC organized an event titled “Youth for the Himalayas to Innovate, Inspire, and Impact” featuring inspirational work from various institutions focused on mountain systems. Dr. Salvador Lyngdoh, Scientist WII, gave a special address on wildlife threats and opportunities in the Himalayas. The event was hosted by IUCN, the National Museum of Natural History, and the MoEFCC's Mountain Division.

VISIT OF IFS PROBATIONERS OF 2024-26

112 IFS probationers of the 2024-26 batch, along with two trainees from the Royal Bhutan Forest Service from IGNFA, Dehradun, visited WII on 16th December 2024. The Director and Faculty Members of WII interacted with them. Dr. Ruchi Badola, Dean of the Faculty of Wildlife Sciences, briefed them on WII's activities, and Dr. CP Sharma provided hands-on exposure to forensic and Pashmina work.

FIRST EVER TAGGING OF GANGES RIVER DOLPHIN

The first tagging of the Ganges River Dolphin, funded by the National Campa Authority, was conducted by WII in collaboration with the Assam Forest Department and Aaranyak on 18th December 2024. A healthy male river dolphin from the Kulsi River, a tributary of the Brahmaputra, was satellite-tagged and released by a team of experts. The tagging process was led by PI, Dr Vishnupriya Kolipakam, and was supported by Prof. Qamar Qureshi, Dr. Uzma, Dr. Zia Ullah, Dr. Sanath Muliya, Dr. Lallianpuii Kawlni, Dr. Deboabrata Phukon, and Mr. Suresh Babu. The tagging of the river dolphin is expected to help understand species' seasonal movements and migratory patterns along its range, species distribution, and habitat utilisation, and is particularly important in understanding the movement patterns in disturbed river system.

FIRST INDIA MANGROVE CONCLAVE 2024

The first India Mangrove Conclave was held in Chennai, Tamil Nadu, from 16th to 17th December 2024 with the vision to make mangrove science, research, and best practices readily available and accessible to managers and other stakeholders, to ensure sustainability and resilience of these ecosystems for the benefit of society. Dr. Nehru Prabakaran, Faculty, WII, was among the members of an expert panel that interacted with the participants on various aspects of mangrove research and management at the conclave.

LEGACY IN RETIREMENT:
HONOURING OUR RETIRED PERSONNEL

During the months of October to December, the institute celebrated the service provided by the following personnel:

Shri Rajeev Kumar Gambhir, who served as a Staff Car Driver (Special Grade) was part of the institute from 07.08.1991 to 30.11.2024.

Shri Vijay Prasad
(Assistant Grade - III)
08.08.1991 - 31.12.2024

Shri Mukti Prasad Sharma
(Multi Tasking Staff)
01.09.2003 to 31.10.2024

Prof. Qamar Qureshi
(Scientist- G)
23.04.1993 to 31.10.2024

Patron: Sh. Virendra R. Tiwari (Director)

Editors: Dr. Bivash Pandav, Dr. Vishnupriya Kolipakam, Mr. Ritesh Kumar Gautam (Lead) & Ms. Amarjeet Kaur (Lead)

Lead Associate Editor (review, proofreading & copy-editing): Ashish Joseph, & Shimontika Gupta

Associate Editors (proofreading & copy-editing support): Esther Hmar, Nayana Prasanna, Priyanjali Singh, & Smriti Sharma

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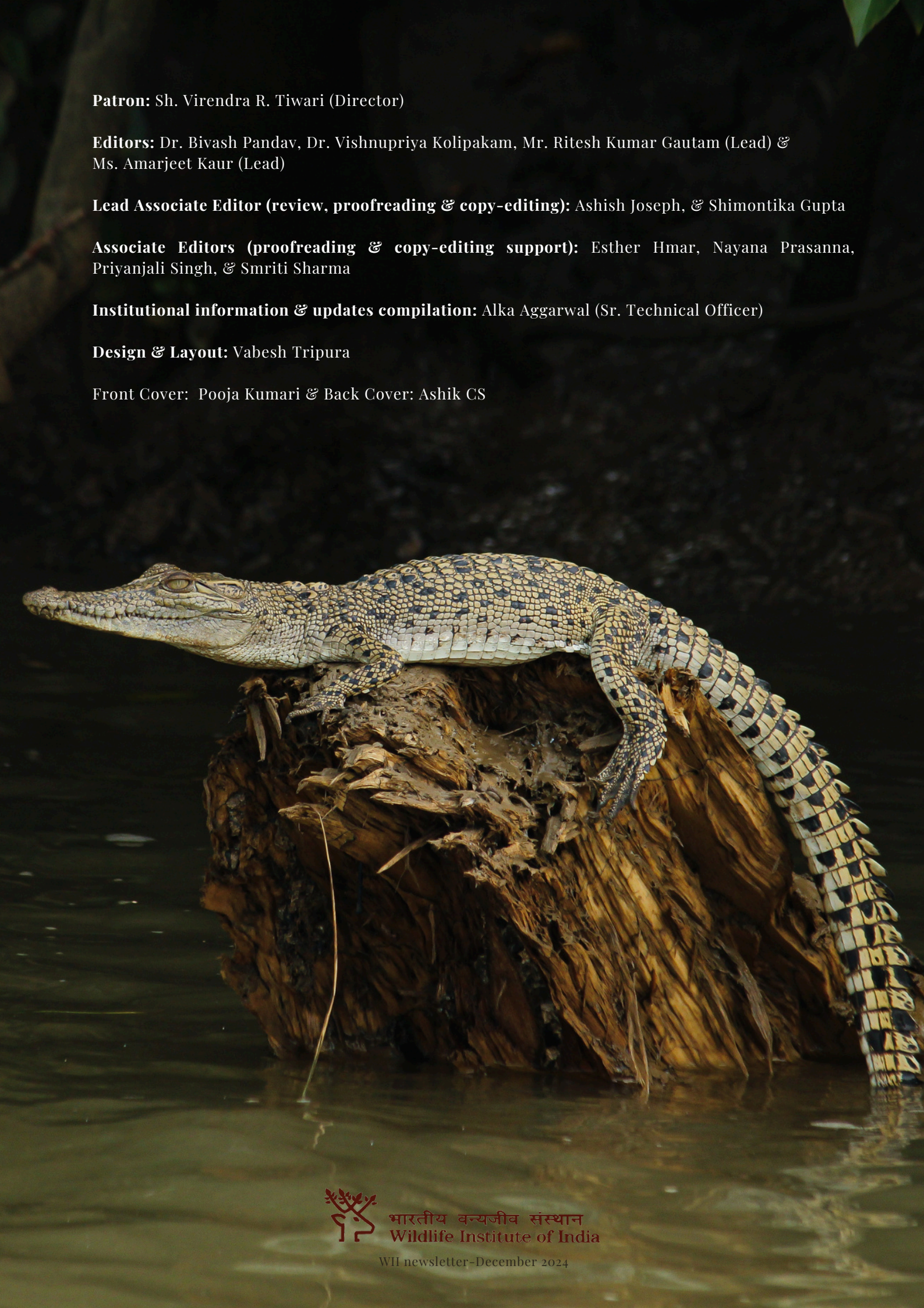

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

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