

ZSL SCIENCE AND CONSERVATION EVENT

**Monsoon, Umbrellas and Gharials:  
what can conservation of the world's weirdest  
crocodile teach us about saving rivers?**



**Tuesday 12 April 2022**

**5:00pm – 6:30pm UK Time (BST)**

Online event livestreamed to [zsl.org/IOZYouTube](https://www.zsl.org/IOZYouTube)

[Direct link: <https://youtu.be/pTQ7zmdnxoY>]

There is no charge for this event, and no need to register in advance

## **AGENDA**

**Phoebe Griffith, DPhil Candidate, Institute of Zoology, Zoological Society of London and  
University of Oxford**

*Dam! Lessons about saving rivers from forty years of gharial conservation*

**Ranjana Bhatta, EDGE Fellow, Zoological Society of London and President, Care for Nature**  
*Flirting fathers and marvellous moms: an insight from the reproductive behaviour of gharial in  
Chitwan National Park*

**Bibek Raj Shrestha, Research Associate, Global Institute for Interdisciplinary Studies (GIIS)**  
*Introduction to the complex and multifaceted issue of sand mining in Nepal and international  
concerns*

**Dr Bhagawan Raj Dahal, Deputy Country Manager, ZSL Nepal Office**  
*Community-centred conservation as a way forward for gharial conservation*

## ABSTRACTS

### **Dam! Lessons about saving rivers from forty years of gharial conservation**

*Phoebe Griffith, DPhil Candidate, Institute of Zoology, Zoological Society of London and University of Oxford*

Gharial are one of the most unique crocodylians, with their unusual skull morphology, acoustic communication, highly aquatic nature and communal reproductive behaviours. Crocodylians are, however, a more diverse group than is often portrayed, with a range of diets, burrow-digging habits, ability for overland movement and size, from species that are adults by 1 metre, to those that can reach up to 8 metres. Nearly 60% of crocodylian species are threatened with extinction, partially due to the intrinsically fragile habitats in which they are found: freshwater and coastal ecosystems and vulnerable to high levels of human-caused change. One such river basin is that of the Ganges in South Asia, a challenge for water resource management and freshwater conservation, supporting over 500 million people and the only remaining gharial in the world.

In this talk, I will discuss recent discoveries about gharial ecology and biology, and what an understanding of successful and unsuccessful conservation interventions can tell us about the management of rivers and freshwater species more broadly. Key threats include the building of dams and other infrastructure which disrupt habitats and migrations of gharial, fishes and other species, the use of destructive and unsustainable fishing methods, and sand mining. The broad habitat requirements of gharial – free-flowing clean rivers with high sand-banks for nesting, and deep pools and confluences for hunting – make them especially vulnerable to a range of threats. However, their extensive and complex requirements also make them a potential umbrella species – a species whose conservation can have positive impacts on a range of co-occurring species.

Gharial remain Critically Endangered despite 40 years of conservation action, illustrating how a single-species approach to conservation rarely works, and that a more holistic approach that involves the whole ecosystem, and most importantly involves communities local to that ecosystem, is vital for both successful conservation and sustainable development along rivers.

**Phoebe Griffith** is a DPhil candidate at the ZSL Institute of Zoology and University of Oxford. She researches crocodylian conservation, with a particular focus on understanding why the gharial crocodylian remains Critically Endangered in Chitwan, Nepal. With her team and collaborators, she is using a multi-method approach including radio telemetry, direct and remote observations, social surveys and interviews to understand the ecology and impact of conservation measures on gharial and co-occurring freshwater megafauna. Phoebe is a National Geographic Explorer, Research Fellow of Himalayan Nature and member of the IUCN SSC Crocodile Specialist Group.

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## Flirting fathers and marvellous moms: an insight from the reproductive behaviour of gharial in Chitwan National Park

*Ranjana Bhatta, EDGE Fellow, Zoological Society of London and President, Care for Nature*

Gharials are considered as extraordinary parents as they intensively look after their babies until the monsoon arrive. Gharials are very social, especially during the breeding time because they nest at one place together by digging hole on sand bank. They are allo-parents which means they take care of hatchlings coming out not only from their own nest but also from several other nests at communal nesting sites. Both males and females are involved in guarding duty. In Nepal, male parenting was rarely seen, while it is very common in Chambal population in India. At the beginning of February, several breeding females gather at the nesting sites and the dominant male also joins the group. The male is very “flirty” as it keeps running behind many females for mating. The male produces a large sound called a "POP" to attract females for mating. In Chitwan, the male was found just to be flirty and was not involved in guarding babies. The eggs are hatched in June to July. When mother gharial hears hatchlings call from the nest, it excavates the nest and the hatchlings come out and go in to the water on their own. Hatchlings coming from several nests gather at one place and the dominant female/male guards them for next two months or so. The reproductive behaviours of gharials make them such a special and unique species.

**Ranjana Bhatta** is a conservation biologist working on gharial conservation in Nepal. She is also a Nat Geo PhotoArk EDGE fellow studying the reproductive behaviours as well as acoustic communication of the gharial in Chitwan National Park. The behaviours of Nepal's gharial have been poorly understood and this fellowship offered an opportunity to give insights of gharial's reproductive system in Chitwan. Currently, she is working as a conservation biologist at a small local NGO called Care For Nature (CFN), which she founded in 2019. CFN works to develop the community outreach program to raise awareness of, and involve local people in gharial conservation. CFN successfully conducted the Nepal crocodile Conservation Fair 2022 in Chitwan on 25<sup>th</sup> and 26<sup>th</sup> of March where many students from schools and colleges were involved to raise awareness for the current condition, threats and future conservation of gharial. Similarly, many local collaborators participated in the conservation fair.

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## Introduction to the complex and multifaceted issue of sand mining in Nepal and international concerns

*Bibek Raj Shrestha, Research Associate, Global Institute for Interdisciplinary Studies (GIIS)*

Sand is among the most mined non-metallic minerals to meet the demand of construction and land reclamation globally. With rapid urbanisation and growing cities, the need for sand has been increasing to meet up with the infrastructure developments. As desert sands are of no use for construction, river sands are highly sought after as it binds well with the concrete. This has led to excessive river sand mining and their exports. The problem is however they are being extracted at a higher and faster rate than they are naturally replenished.

The excessive, unregulated, illegal, and unsustainable sand and gravel extraction causes water pollution, erodes coastline, destroys river ecosystems, including breeding habitats for riverine birds

and animals such as gharials and Ganges dolphins, and often disrupts livelihoods. Understanding and managing the magnitude of threat to biodiversity loss from sand mining requires a global commitment and action towards prioritising conservation objectives over economic expansions.

**Bibek Raj Shrestha** is an applied ecologist. He is a graduate of the International Masters in Applied Ecology, an Erasmus Mundus Joint Master Degree from the University of East Anglia, UK, University of Poitiers, France, Kiel University, Germany, and Universidad San Francisco de Quito (USFQ), Ecuador. His current interest lies in conducting research to answer ecological questions with an underlying focus on conservation. He is thrilled to have worked on: snow leopards on the rugged Himalayas, tigers in the lush jungles and critically endangered turtles in meandering rivers of Cambodia.

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### **Community-centred conservation as a way forward for gharial conservation**

*Dr Bhagawan Raj Dahal, Deputy Country Manager, ZSL Nepal Office, Zoological Society of London*

Gharials are one of the rarest crocodile types inhabiting freshwater ecosystems, that are plagued with various threats from pollution, to dam building, to over-exploitation of freshwater resources. Their habitat often coincides with the community settlement boundaries causing further human disturbances. As a result, the mortality of Gharials increases with impact to their liveable habitat as well as their movement. In the case of gharial habitat in Nepal, the banks inhabited by the Gharials are frequented by communities who depend on the same water source for their livelihood. As such, community involvement for Gharial conservation becomes imperative, the lack of which causes deliberate or accidental harm to the gharials, for example through killing or getting caught in the fishing nets. Having communities on board for gharial conservation is crucial, for they coexist with the gharials and are the frontiers for conservation. ZSL Nepal has been working inclusively with communities for gharial conservation, by creating awareness of the importance of gharial conservation, providing alternative income sources to reduce dependence on natural resources, and creating fishing ponds to reduce disturbance to the gharials. The efficiency of these inclusive conservation strategies is showcased by the improvement in the livelihood of the fish-dependent communities, increasing numbers of gharials, rescues of numerous gharials and increased ownership of gharial conservation by the communities.

**Bhagawan Raj Dahal** is the Deputy Country Manager of the Zoological Society of London – Nepal, and has been affiliated with the organisation since 2015, with almost 2 decades of experience in the conservation sector. He has extensive knowledge on the practicalities of conservation with this experience in ZSL and previously in the National Trust for Nature Conservation (NTNC), Birdlife Nepal, and the Red Panda Network. He got his PhD in Landscape Ecology and Conservation Biology from the University of Queensland, prior to which he studied Tropical Ecology for his Master from the University of Bremen, Germany.

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## Format of Live Events

- This interactive online event will be livestreamed to our YouTube channel here: [zsl.org/IOZYouTube](https://zsl.org/IOZYouTube). A direct link to the livestream will also be shared on the event web page before the event.
- Before attending this event, please read our Code of Conduct found [here](#).
- This event will run from 5:00pm – 6:30pm, and will be available to watch afterwards on our YouTube channel.
- Each event will comprise of short presentations from experts in the topic, followed by interactive Q&A and panel sessions. Viewers will be encouraged to join the event live and ask questions using an online platform.
- If you wish to submit a question to a speaker prior to the event, please send it to [scientific.events@zsl.org](mailto:scientific.events@zsl.org). Please be aware we may not be able to answer all questions.
- There is no charge for this event, and no need to register in advance.

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## ZSL Wild Science Podcast

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## [Join our upcoming ZSL Science and Conservation Events](#)

### **Bridging the gap: 25 years of capacity building for wildlife health professionals** 10 May 2022, 6:00pm – 7:30pm (BST)

Over the past twenty-five years ZSL, with partners, has trained over 600 wildlife health professionals, from zookeepers to conservationists in the field. Despite this legacy, the need for highly trained wildlife health professionals is more apparent than ever with the prevalence of zoonotic and wildlife diseases being a keen focus in the public sphere these past 18 months. This event will highlight the diverse set of roles wildlife health professionals trained by the collaborative initiative '[The Wildlife Health Bridge](#)' have gone on to fill and showcase the impact these professionals have had on the wider world of wildlife health.



### **Symposium: Changing the system – a new approach for ocean conservation** 27 – 28 April 2022, 2-day ticketed, free online event

With growing complex and systemic challenges facing the ocean, there is an urgent need to increase the scale and effectiveness of approaches to marine conservation. Recent research points to the need for applying systems change approaches to tackle pressing environmental issues - this involves addressing a problem holistically, determining root causes, barriers to, and opportunities for, change. Here, we will think systemically about how to tackle the global environmental threat and major conservation challenge of ocean plastic pollution. With a diverse programme and insight from experts and local voices, this event will review, inform,

challenge, and inspire a broad, international audience in a new approach to science, practical conservation, and sustainability. **This is a free, ticketed event, and registration is OPEN – click [here](#) for more information.**

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## Further Information

- Please contact the Science Communications and Events Manager, Eleanor Darbey ([eleanor.darbey@zsl.org](mailto:eleanor.darbey@zsl.org)), if you have any queries about our Science events or podcasts.
- For press enquiries, please contact the ZSL Press Office: [press.office@zsl.org](mailto:press.office@zsl.org).
- For more information about how to join as a ZSL Fellow from only £48 and enjoy a year of wonderful wildlife, live from our Zoos, field programmes and scientists – bringing you closer to our global conservation and world leading science – please visit: [www.zsl.org/membership/zsl-fellowship](http://www.zsl.org/membership/zsl-fellowship).
- To receive email updates about forthcoming ZSL Science and Conservation Events, please visit: [www.zsl.org/science/whats-on/science-and-conservation-events-email-updates](http://www.zsl.org/science/whats-on/science-and-conservation-events-email-updates)
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